```
RESULT 6
AAX57045
IID AAX5
IID AAX5
XX AAX5
XX AAX5
XX BASE
XX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Sim
Matches 535;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                           BASB029; Nisseria meningitidis; surface fibril protein; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                                                                                                                         21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY57045 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                from N. meningitidis strain EG329 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                        Misc-difference
                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                 BASB029 amino acid sequence from N. meningitidis strain H44/76.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 present invention.
                                                                                          -difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKKDNKPYRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NNEEQEEDLYLDPVLRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLK 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK.60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                          meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98.7%;
milarity 99.1%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                591 AA;
                                                                                                                                                                                                                                                                                                                                                       (first entry)
                   /note-
123
                                                         /note=
108
                                                                                          /note=
98
                                                                                                                               /note=
92
                                                                                                                                                                    Location/Qualifiers 90
   /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein;
                                      "Encoded
                                                                                                                                              "Encoded by
 "Encoded by
                                                                         "Encoded
                                                                                                              "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2720; DB 22;
Pred. No. 4.3e-157;
1; Mismatches 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                   591
                                                                                                          þу
                                    bу
                                                                       þу
                                                                           AAC"
                                                                                                                GAT"
                                                                                                                                                AAT"
   ACA"
                                        AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                HSF; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
δõ
                                      밁
                                                               QΥ
                                                                                                            Вþ
                                                                                                                                       Qy
                                                                                                                                                                           B
                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 98.1%;
Best Local Similarity 98.3%;
Matches 531; Conservative
```

KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA

SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP

360

351

301

172 121 112

61 52 Н

AGDNLKIKONGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120

NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG

180

231

240

291

NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG

6;

Indels

0;

Gaps

```
This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain H44/76. The BASB029 protein is homologous to the CC Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynucleotide sequences (AAZ39864-239865) and CC polypeptide sequences (AAX57044-Y57045) and their immunogenic fragments. CC BASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polynucleotides and polypeptides are useful for generating an immune cresponse in an animal. A therapeutic composition comprising an antibody CC directed against BASB029: useful in treating humans with Neisseria CC meningitidis disease. The polynucleotide is useful in the diagnosis of CC infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 cc particularly bacterial infections are also useful for treating infections creening and development of antibacterial drugs. Fused recombinant correction the stimulation of the immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New polypeptide from neisseria meningitidis useful for di
treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-MAY-1999;
                                                                                                      receiving
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2000-053103/04
DB; AAZ39865.
                                                                                                   the protein.
                                                                      591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98GB-0010276.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Encoded
Score 2705; DB 21;
Pred. No. 3.5e-156;
6; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAA"
                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 diagnosis,
```

171

```
RESULT 7
AAY23737
ID AAY2
XX AAY2
XX AAY2
XX AAY2
XX BE A SU
XX SURI
KW IMMU
XX Neis
PN W099
PN W099
PN W099
PN 14-I
XX 14-I
XX II-I
X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
Ş
                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                  Query Match
Best Local Similarity
Matches 531; Conser
                                                                                                                                                                                                The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide.
                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                      Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A surface protein of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY23737;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAY23737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (ISIS-) ISIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             532
   60
                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Page 86-87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQESSVSLGAGADAPTLSVDGDALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG
 KAGDNLKIKONGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                   NNEE-QEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITL
                                    NNERPRKKDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITL
                                                                                                                                                                    592 AA;
                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98WO-AU01031.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein;
                                                                                                                97.8%;
98.2%;
                                                                                                                                                                                                                                                                                                                                                                    132pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak IRA;
                                                                                                  4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          592
                                                                                                Score 2695.5; DB 20
Pred. No. 1.3e-155;
4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                 20;
                                                                                                    Indels
                                                                                                                                 Length
                                                                                                                                     592;
                                                                                                                                                                                                                                                                   humans
                                                                                                  ۳.
                                                                                                                                                                                                                                                                                                                                                                                                                     z
                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           411
                                    111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             471
     119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 8
AAY23740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
     ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                  Claim 1;
                                                                Neisseria meningitidis surface proteins meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                    Surface protein; surface glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY23740 standard; Protein;
                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                    14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                      W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAY23740;
                                                                                                                     N-PSDB;
                                                                                                                                                                                                 (ISIS-) ISIS
                                                                                                                                                                                                                                                    12-DEC-1997;
                                                                                                                                                                                                                                                                                                                     24-JUN-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                      immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                   1999-418754/35.
DB; AAX85792.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKDKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Page 100-101; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592
   sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                     INNOVATION QUEENSLAND.
                                                                                                                                                                    Moxon
                                                                                                                                                                                                                                                    97GB-0026398
                                                                                                                                                                                                                                                                                    98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                     peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of Neisseria meningitidis
                                                                                                                                                                    ER,
   represents a
                                                                                                                                                                                                                      GIJ
                                                                                                                                                                      Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           594
                                  English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
     surface
                                                                                    useful
   protein
                                                                                      for
     of
                                                                                                                                                                                                                                                                                                                                                                                                                                      vaccine;
                                                                                    treating
     Neiserria
                                                                                    z
```

```
RESULT 9
AAX'STORM
ID AAX'S
XX AAX'S
XX AAX'S
XX AAX'S
XX BASI
XX BASI
XX BASI
XX Infe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                      ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                            AAY57044;
                                                                                                                                                                                                                                                                                                                       AAY57044 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                             BASB029; Nisseria men infection; treatment;
                                                                                                                                                                               BASB029 amino acid sequence from
                                                                                                                                                                                                                               21-FEB-2000
  Misc-difference
                                                                    Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                      593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             501;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                    8-8
8-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDDLYLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL::||||||||||||||||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALN
                                                                  meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                                                                                                                      594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                          (first entry)
Location/Qualifiers 104
                                                                                                          meningitidis;
ent; prevent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                91.1%;
92.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          13;
                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 2512; DB 20;
Pred. No. 1.8e-144;
3; Mismatches 20;
                                                                                                             surface fibril pro
antibacterial drug
                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                               N. meningitidis strain
                                                                                                                                  protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 594;
                                                                                                                                                                                  ATCC13090
                                                                                                                                     HSF;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                     diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                     γQ
                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                      γQ
                                                                                                             B
                                                                                                                                                     δÃ
                                                                                                                                                                                                     В
```

```
$\times C C C C C C C C C C C C C C C C C C X \times X \t
γ
                                                                                                                                                                                                                                                                                                                                         This is the Nisseria meningitidis BASB029 amino acid sequence from CC serogroup B strain ATCC13090. The BASB029 protein is homologous to the CC Haemophilus influenzae surface fibril (HSF) protein. The invention CC relates to BASB029 polynuclectide sequences (AAX29864-239865) and CC polypeptide sequences (AAX57044-Y57045) and their immunogenic fragments. CC BASB029 polypeptides are useful in a method of diagnosing a Neisseria CC meningitidis infection in a mammal. Compositions containing BASB029 CC polypuclectides and polypeptides are useful for generating an immune Cresponse in an animal. A therapeutic composition comprising an antibody CC directed against BASB029 is useful in treating humans with Neisseria CC meningitidis disease. The polynuclectide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an CC infection which results from increased or decreased expression of the CC particularly genetic immunisation. Antibodies against BASB029 CC particularly genetic immunisation. Antibodies against BASB029 CC particularly bacterial infections. The protein is useful in the CC particularly section of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an organism protein is useful for the stimulation of the immune system of an organism
                                                                                   Matches
                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ruelle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New polypeptide from neisseria meningitidis useful treatment or prevention of bacterial infections in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           W09958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                 receiving
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000-053103/04.
                                                                                   501;
           6
                                                                                                                                                                                                                                                                                                             the protein.
                                                                                                                                                                                                                                      594 AA
                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Encoded
                                                                                                                   91.1%;
92.4%;
                                                                                   13;
                                                                           Score 2512; DB 21;
Pred. No. 1.8e-144;
13; Mismatches 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       by AATC"
                                                                                   Indels
                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for diagnosis,
                                                                                                                                                              594;
                                                                                                                                                                                                                                                                                                                                                         of an organism
                                                                               8
                                                                               Gaps
```

```
B
                                                                                    233
                                                                                                        180
                                                                                                                             173
                                                                                                                                                  120
                                                                                                                                                                       113
                      300
                                           293
  353
                                                                                                                                                                                           66
                                                                                                                                                                                                              54
                                         GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF 299
                                                                                   TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 179
                                                                                                                                                                      KIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE
                                                                                                                                                                                 KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG 119
DDDLYLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNL
                                                                                                                                                                                                                          112
                                                                                    292
                                                                                                       239
```

```
RAESULT 10
AAU06174
ID AAU06
XX AAU06
XX AAU06
XX DT 24-OC
XX Surfa
XX Surfa
XX Neiss
XX Neiss
XX Regic
FT Regic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Key
Region
                                                                                                                                                                                                                                                                                                                                  Region
                            Peak IRA,
                                                                                                                                   02-AUG-2001
                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAU06174 standard;
                                                                              25-JAN-2000;
                                                                                                         25-JAN-2001;
                                                                                                                                                             WO200155182-A1
                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                    (UYQU ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             meningitidis
    2001-488774/53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ø,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           meningitidis strain
                           Jennings MP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                     QUEENSLAND
                                                                              2000US-0177917
                                                                                                         2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                     /note= "V
239..594
/label= C
/note= "C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EG327 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                             /label= V3
/note= "Variable
213..231
                                                                                                                                                                                                                           /label= V4
/note= "Variable region
                                                                                                                                                                                                                                                        232..238
                                                                                                                                                                                                                                                                                                                                                                         /label= V2
/note= "Variable
127..190
                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Conserved
117..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Variable region 1"
105..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= v1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note=
                                                                                                                                                                                                                                                                   note= "Conserved
                                                                                                                                                                                                                                                                                                                                                'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein;
                                                                                                                                                                                      "Conserved
                                                                                                                                                                                                                                                                                                                                                "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Conserved region
                                                                                                                                                                                                     G
                                                                                                                                                                                                                                                                                  C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EG327
                                                                                                                                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                                                                                region
                                                                                                                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  532
                                                                               . :
RESULT 11
AAY23739
ID AAY23
                                                                                                                                            Qy
                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                        ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                       B
                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                    БР
                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                              Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain EG327 is 1 of 10 NhhA polypeptide sequences (AAU06181) from 10 different N. meningitidis strains given in
 AAY23739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for t preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the present invention.
                                                                                          539
                                                                                                                    533
                                                                                                                                                479
                                                                                                                                                                        473
                                                                                                                                                                                                 419
                                                                                                                                                                                                                           413
                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            113
                                                                   593
                                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     501;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAS09164
                                                                                                                   PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALM
                                                                                                                                                                                                                                                                                ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                 TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              standard;
                                                                 Ş
                                                                                            QW 540
                                                                                                                                                                       VGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                     VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                           TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KIKONTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGLNFAKKTAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDDLYLEPVQRTAVVLSFRSDKEGTGEKE-VTEDSNWGVYFDKKGVLTAGTITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                   594
  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              91.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2512; D
Pred. No. 1.8e
13; Mismatches
    594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 22;
.8e-144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       or
```

292 239 232 172

538

592

532

478 472 418 412 359 352 299 119 112

```
밁
                     δÃ
                                        В
                                                       δõ
                                                                         밁
                                                                                     Ş
                                                                                                          밁
                                                                                                                        δõ
                                                                                                                                        Ъ
                                                                                                                                                       γQ
                                                                                                                                                                            밁
                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 500; Conser
                                                                                                                                                                                                                                                                  The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                 (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                  WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                           12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY23739;
                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                               þe
                                                                                                                                                                                                                                                                                                                                                Claim 1; Page 95-97; 132pp;
                                                                                                                                                                                                                                                                                                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                 Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             immunoreactive
                                                                                                                                                                                                                                                               used
                                                                                                                                                                                                                                                                                                                                                                                                  1999-418754/35
         349
                         296
                                          289
                                                         236
                                                                           229
                                                                                           176
                                                                                                          169
                                                                                                                            116
                                                                                                                                            109
                                                                                                                                                            62
                                                                                                                                                                           50
                                                                                                                                                                                             Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                  UNIV
                                                                                                                                                                                                                                                               ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein; surface
                                                                                                                                                                                                                                                                                                                                                                                         AAX85791
                                                                                                                                                    GDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAK
       NVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                 KLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                  GVKPGTTASDNVDFVRTYDTVEELSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                  ETAGTINGDTTVHLNGIGSTLTDTLLNTGATTINVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                          GDNLKIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
                                                                                                                                                                          GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                    NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGYLTAREITLKA
                                                                                                          ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein of Neisseria meningitidis
                                                                                                                                                                                                                                              594
                                                                                                                                                                                                            90.4%;
nilarity 91.6%;
Conservative
                                                                                                                                                                                                                                                              identify
                                                                                                                                                                                                                                                                                                                                                                 infections
                                                                                                                                                                                                                                                                                                                                                                                                                                  INNOVATION LTD. QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                 Moxon
                                                                                                                                                                                                                                              Ą,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                           97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-AU01031
                                                                                                                                                                                                                                                              immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                  ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                   Peak
                                                                                                                                                                                                             9;
                                                                                                                                                                                                                                                                                                                                                English.
                                                                                                                                                                                                            Score 2493; DB 20;
Pred. No. 2.6e-143;
9; Mismatches 29;
                                                                                                                                                                                                                                                                                                                                                                                                                   IRA;
                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                             594;
                                                                                                                                                                                                                                                                                              humans.
                                                                                                                                                                                                                                                                                                                                                                        z
                                                                                                                                                                                                            8
                                                                                                                                                                                                            Gaps
                                                                                                                          175
                                                                                                                                                           115
                                                                                                                                           168
                                                                                                                                                                           108
                       355
                                         348
                                                        295
                                                                         288
                                                                                          235
                                                                                                          228
                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 12
AAU06179
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                 z
                                                                                                                                                                                                                                                                                                                                               кеу
                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU06179;
WPI; 2001-488774/53.
                Peak IRA,
                                Oğyu)
                                                                25-JAN-2001;
                                                                                 02-AUG-2001
                                                                                                  WO200155182-A1
                                                                                                                                  Region
                                                                                                                                                           Region
                                                                                                                                                                                  Region
                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                 24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                               meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                               ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
```

```
οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Surface antigen NhhA; meningococcal disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAU06179 standard; Protein; 594 AA
                                                               25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        {\tt ATAGLYQAYLPGKSMMAIGGDTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GALNVGSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis strain B2198
Jennings MP
                               QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                               2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                      /label= C3
/note= "Conserved 1
191..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BZ198
                                                                                                                                                                                                                        /label= V4
/note= "Variable
239..594
                                                                                                                                                                                                                                                                                                     /label= C4
                                                                                                                                                                                                                                                                                                                                       /label= V3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V2
/note= "Variable
127..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= C2
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label C1
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cocation/Qualifiers
                                                                                                                                                                                                           /label=
                                                                                                                                                                                                                                                                                        'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'note-
                                                                                                                                                                                                                                                                           . 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              surface antigen NhhA polypeptide sequence
                                                                                                                                                                                          "Conserved region
                                                                                                                                                                                                                                                                                        "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Variable
                                                                                                                                                                                                                                                           ٧4
                                                                                                                                                                                                                                         region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region
                                                                                                                                                                                                                                                                                                                                                                                                                                      region
                                                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                     region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ļ,
                                                                                                                                                                                                                                                                                                                                                                                                                                       2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       534
```

```
δ
                                                                        밁
                                                                                             Ď.
                                                                                                                      밁
                                                                                                                                       Q
                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                      δ
                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Sin
Matches 500;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain BZ198 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  present
                                                                        529
                           589
                                                                                                                      469
                                                                                                                                            416
                                                                                                                                                                    409
                                                                                                                                                                                                                 349
                                                                                                                                                                                          356
                                                                                                                                                                                                                                                            289
                                                                                                                                                                                                                                                                                   236
                                                                                                                                                                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                                                       169
                                                                                                                                                                                                                                                                                                                                                                                                    109
                                                                                                                                                                                                                                                                                                                                                                                                                                                50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fig
                                                                                                                                                                              GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD
                                                                                                                                                                                                                                                         KLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                       GDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAK
                                                SVGYQW 540
                                                                                  ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                         NVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                 ETAGTINGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                           SVGYQW
                                                                       ATAGLVQAYLPGKSMMAIGGDTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                     GALNVGSKDTNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                 - ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                                                  GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                             NVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                      ETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                  GDNLKIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                               NATDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       90.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2493;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 22;
2.6e-143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           or
                                                                                                                                           474
                                                                                                                                                                  468
                                                                                                                                                                                                             408
                                                                                                                                                                                                                                    355
                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                                                           175
                                                                                                                                                                                                                                                                                                                                                                                                  168
                                                                                                                                                                                                                                                                                                                                                                                                                                               108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                        588
                                                                                                                     528
                                                                                                                                                                                                                                                                                                         288
                                                                                                                                                                                                                                                                                                                               235
                                                                                                                                                                                                                                                                                                                                                      228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        į
                                           Q
                                                                      В
                                                                                                                    밁
                                                                                                                                        8
                                                                                                                                                                  밁
                                                                                                                                                                                      Ş
                                                                                                                                                                                                             В
δÃ
                        망
                                                                                          Qy
                                                                                                                                                                                                                                  Qy
```

RESULT 13
AAY23738
ID AAY23

AAY23738

standard;

Protein;

Ä

```
Query Match
Best Local S
Matches 496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the detection or diagnosis of N. meningitidis infection in human: The N. meningitidis surface glycoprotesins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (ISIS-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY23738;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1999-418754/35
DB; AAX85790.
                                  292
                                                                     289
                                                                                                       232
                                                                                                                                           229
                                                                                                                                                                              172
                                                                                                                                                                                                                 169
                                                                                                                                                                                                                                                  112
                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                        50
                                                                                                                                                                                                                                                                                                                                                                                                                             al Similarity
496; Conser
                                                                                                                                                                                                                                                                                                                                                                                           2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein;
                                                                                                                                                            WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                  NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                                                   GDNLKIKQNTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGL
                TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                      EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                           GDNLKIKQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page 91-93; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ΜP,
TSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                         WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIK
                                                                                                                                                                                                               NFAKETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                                                                                                                        NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                     EKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INNOVATION
QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                            89.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak
                                                                                                                                                                                                                                                                                                      NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                                                                                                                          Score 2478; E
Pred. No. 2.1e
l1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            infection;
                                                                                                                                                                                                                                                                                                                                                                                                                          DB 20;
1.1e-142;
1es 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 treating
                                                                                                                                                                                                                                                                                                                                                                                                                             12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   z
                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                     168
                                                                                                                                                                            231
                                                                                                                                                                                                                                                                                                                     111
                                                                                                                                                                                                                                                                                                                                                        108
                                                                                                                                                                                                                                                                                                                                                                                           61
                                  351
                                                                  348
                                                                                                     291
                                                                                                                                         288
                                                                                                                                                                                                               228
                                                                                                                                                                                                                                                 171
408
```

δã

Qγ B Ş B

밁 δ 밁

```
RESULT 14
AAY23742
ID AAY23
XX AAY23
XX AAY23
XX AAY23
XX DF A Sur
XX Inmun
                                                                                                               Query Match
Best Local S
Matches 497
                                                                                                                                                                                                                                  meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans the N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (UYQU)
                                                                                                                                                                                                                                                                                                                                                                                         The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidi
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 1; Page 108-110; 132pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis surface meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1999-418754/35.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       immunoreactive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAY23742;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY23742
                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               352
                                                                                                                 497;
                            50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VIND
                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAX85794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                      NATDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKA
                                            NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard; Protein; 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTSASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein of Neisseria meningitidis.
                                                                                                                                                                                                 598
                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INNOVATION LTD QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Moxon
                                                                                                                                                                                                 ₽
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ER,
                                                                                                                                89.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peak
                                                                                                            10;
                                                                                                          Score 2478; DB 20;
Pred. No. 2.1e-142;
0; Mismatches 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proteins useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      vaccine;
                                                                                                                                                    Length
                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   treating
                                                                                                                                                    598;
                                                                                                            12;
                                                                                                                                                                                                                                                                                                                         humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     z
                      108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                          ω
RESULT 15
AAU06177
ID AAU066177
AC AAU06
XX AAU06
XX AAU06
XX VX VX
DE N. m
XX Surf
XX Neis
YY FT Reg
FT Reg
FT Reg
FT Reg
FT Re
FT FT 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N. meningitidis
                                          Region
                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU06177
                                                                                                          Region
                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis strain H15.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GDNLKIKQNTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                 /label= V3
/note= "Variable:
217..235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NhhA;
                                                                                                        /label= C3
/note= "Conserved
195..216
                                                                                                                                                                                                                                                                                                                                                                                /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               H15 surface antigen NhhA polypeptide sequence
                                                                                                                                                                        /note= "Variable
131..194
                                                                                                                                                                                                                                         /label= C2
/note= "Conserved
117..130
  /note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                      /label=
                                                                                                                                                                                                                                                                                                                                               /label=
                                                                                                                                                                                                                                                                                                                                                                                                             /Label=
                                                                                                                                                                                                                'label=
                                                                                                                                                                                                                                                                                                                         'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                       . 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningococcal disease;
                                                                                                                                                                                                                                                                                                                    "Variable
                                                                                                                                                                                                                                                                                                                                                                                     C1
Conserved
                                                                                                                                                                                                                                                                              C2
                        C4
                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                 ≤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                598
                                                                region
                                                                                                                                                                                          region
                                                                                                                                                                                                                                                                                                                         region
region
                                                                                                                                                                                                                                                                                                                                                                                       region
                                                                                                                              region
                                                                                                                                                                                                                                                        region
                                                                                                                                                                                                                                                                                                                                                                                       ין
                                                                                                                                ω
                                                                                                                                                                                                                                                             Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                168
```

밁 Q

```
Ş
                                                         B
                                                                                Q
                                                                                                                 Д
                                                                                                                                           Qy
                                                                                                                                                                        DЬ
                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H15 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New NhhA surface antigen polypeptides and polynucleotides Neisseria meningitidis, useful in producing vaccines for preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-PSDB; AAS09167.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO200155182-A1?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                         the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2001-488774/53
   349
                                                                                                                 229
                                                                                                                                                                           169
                                                         289
                                                                                                                                              172
                                                                                                                                                                                                                                   109
                                                                                                                                                                                                                                                                                                                                                    497;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                           50
                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                                                  Similarity
             TSGTNYTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                      WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                         NATDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKA 108
                                                                                                                                                                                                                                 GDNLKIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGL
                                                                                                                                                                                                                                                GDNLKIKQ-------GTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                       EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                 WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                           NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGYLTAREITLKA 61
TSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                        EKDGKLYTGKGKDENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                              598 AA;
                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               236..242
/label= V4
/note= "Variable r
/1258
/label= C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                               89.9%;
                                                                                                                                                                                                                                                                                                                                                   10;
                                                                                                                                                                                                                                                                                                                                                 Score 2478; D
Pred. No. 2.1e
10; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                   DB 22;
2.1e-142;
hes 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ហ្ម
                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                              Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s from
treating
                                                                                                                                                                                                                                                                                                                                                    12;
                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   or
                            351
                                                        348
                                                                                   291
                                                                                                                 288
                                                                                                                                            231
                                                                                                                                                                        228
                                                                                                                                                                                                    171
                                                                                                                                                                                                                                 168
                                                                                                                                                                                                                                                              111
```

```
Q
                        В
                                    Q
                                                 В
                                                           δÃ
                                                                          밁
                                                                                     QY
589
            531
                         529
                                     471
                                                 469
                                                             412
                                                                          409
                                                                                       352
      GASASVGYQW
                                                                         GASASVGYQW
                                               AQAIATAGLAQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDTGNWVIKGTASGNSRGHF
                               AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
           540
598
```

470 528

530 588

Search completed: October 6, 2003, 09:22:37 Job time: 47.3729 secs

```
5.1.6
Compugen Ltd.
GenCore version
Copyright (c) 1993 - 2003
```

- protein search, using sw model OM protein 6, 2003, 09:14:45; Search time 14.4407 Seconds (without alignments) 1582.188 Million cell updates/sec October Run on:

Perfect score:

US-09-771-382-33 2757 1 NNEEQEEXLXLHPVQRTVAV.....TASGNSRGHFGASASVGYQW 540 Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

Total number of hits satisfying chosen parameters: 328717 seqs, 42310858 residues Searched:

328717

length: 0 length: 2000000000 Minimum DB seq Maximum DB seq

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database

Issued_Patents_AA:*

1: /cgn2_6/ptodata/1/iaa/5A_COMB.pep:*
2: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
3: /cgn2_6/ptodata/1/iaa/6A_COMB.pep:*
5: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
5: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*
6: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

		æ				
Result		Query				
No.	Score	Match	Length	DB	ID	Description
-	2727	98.9	591	3	US-09-377-155-21	Sequence 21, Appl
2	2727	98.9	591	4	US-09-669-974-21	21,
m	2720	98.7	591	m	S	11,
4	2720		591	4	US-09-669-974-11	11,
S.	2695.5		592	က	US-09-377-155-2	2,
9	2695.5		592	4	-09-669-974-	7
7	2512		594	m	US-09-377-155-9	Sequence 9, Appli
œ	2512		594	4	US-09-669-974-9	6
6	2493		594	٣	US-09-377-155-7	7,
10	2493	90.4	594	4	US-09-669-974-7	Sequence 7, Appli
11	2478	89.9	598	ო	US-09-377-155-5	J.
12	2478	89.9	598	m	US-09-377-155-13	13,
13	2478	89.9	598	4	US-09-669-974-5	5,
14	2478	89.9	598	4	US-09-669-974-13	13,
15	2430.5	88.2	599	æ	US-09-377-155-15	15,
16	2430.5	88.2	599	4	US-09-669-974-15	15,
17	2321	84.2	592	m	US-09-377-155-17	Sequence 17, Appl
18	2321	84.2	592	4	US-09-669-974-17	17,
19	2241.5	81.3	589	æ	US-09-377-155-19	19,
20	2241.5		589	4	US-09-669-974-19	19,
21	1033.5	37.5	2411	4	US-09-268-347-36	36,
22	1031.5	37.4	2353	m	US-09-377-155-33	33,
23	1031.5	37.4	2353	e	US-08-913-942-4	Sequence 4, Appli
24	1031.5	37.4	2353	4	US-09-669-974-33	33,
25	1030.5	37.4	2354	4	US-09-268-347-47	47,
26	1019.5	37.0	607	Н	5	6, 7
27	1019.5	37.0	607	m	US-08-685-467-6	9

SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 360

301

δ

Sequence 6, Appli	Sequence 4, Appli	Sequence 32, Appl	Sequence 2, Appli	Sequence 2, Appli	Sequence 32, Appl	Sequence 2, Appli	Sequence 32, Appl	Sequence 44, Appl	2,	Sequence 5, Appli	Seguence 5, Appli	Sequence 15, Appl	Sequence 26, Appl	Sequence 30, Appl	Seguence 28, Appl	Sequence 34, Appl
US-08-913-942-6	US-08-685-467-4	US-09-268-347-32	US-08-409-995-2	US-08-685-467-2	US-09-377-155-32	US-08-913-942-2	US-09-669-974-32	US-09-268-347-44	US-08-409-995-5	US-08-685-467-5	US-08-913-942-5	US-08-913-942-15	US-09-268-347-26	US-09-268-347-30	US-09-268-347-28	US-09-268-347-34
ъ г	ı m	4	٦	٣	r	3	4	4	П	٣	m	m	4	4	4	4
607	1912	1094	1098	1098	1098	1098	1098	1098	658	658	658	619	619	1004	1104	1104
37.0	37.0	33.6	32.9	32.9	32.9	32.9	32.9	32.9	32.3	32.3	32.3	29.4	29.4	21.7	21.5	21.5
1019.5	1019.5	927	908	806	806	806	.806	806	890	890	890	809.5	809.5	598.5	593.5	593,5
28	30	31	32	33	34	32	36	37	38	39	40	41	42	43	44	45

ALIGNMENTS

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    52 NNEEQEEDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLK 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61 AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241 KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                 Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                              Score 2727; DB 3;
Pred. No. 3.2e-203;
1; Mismatches 3;
                                                             APPLICANT: PERK, Ian Richard Anselm APPLICANT: PERK, Ian Richard Paul APPLICANT: DENNINGS Michael Paul APPLICANT: MOXON, E. Richard Full CTILE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SEQ ID NO 21
                Sequence 21, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Neisseria meningitidis US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                98.9%;
99.3%;
                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity 99.3
Matches 536; Conservative
                                                GENERAL INFORMATION:
US-09-377-155-21
                                                                                                                                                                                                                                                                                                               LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
```

591

```
AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTASDNVDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                  SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2720; DB 3;
Pred. No. 1.1e-202;
1; Mismatches 4;
                                                                                                                                                                                APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: MOXON, E. Richard Paul TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
NUMBER OF SEQ ID NOS: 33
SOUTHAND IN OUT OF SEQ ID NOS: 33
SEQ ID NO 11
                                                                                                                                            Sequence 11, Application US/09377155 Patent No. 6197312 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 98.7%;
Best Local Similarity 99.1%;
Matches 535; Conservative
                                                                                                                                 US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                        591
                           472
                                                     481
                                                                               532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                           g
                                                     δy
                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                               480
                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                         531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       292 KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTNVTFA 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGDNLK I KONGTNFTY SLKKDLTDLFSVGTEKLSFSAHGNKVNI TSDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                   QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG
                              SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG
                                                                                SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2727; DB 4;
Pred. No. 3.2e-203;
                                                                                                                                                                                                                                                GENERAL INCORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: WOXON, E. Richard
ITILE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 06504/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-14
SPRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1; Mismatches
                                                                                                                                                                                                                           Sequence 21, Application US/09669974
Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98.9%;
99.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Local Similarity 99.3
Matches 536; Conservative
                                                                                                                                                                                                                US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-669-974-21
                                                                                                         472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          412
                                                     412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        352
  352
                              361
                                                                               421
                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
  셤
                                                     g
                                                                               ò
                                                                                                                                   ð
                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                            ö
```

ö

Gaps

; 0

Indels

111

9

171

231

291

480

471

360 411 540

591

```
292 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 NNEE-QEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60 KAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180 GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300 ASCKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420 GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2695.5; DB 3;
Pred. No. 8.9e-201;
4; Mismatches 5; I
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REPERBENCE: 06564/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN UN OFF. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: PEAK, Ian Richard Anselm PAPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard IITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; Sequence 2, Application US/09669974
; Patent No. 6333173
                                                                                                                                                                                                                                                                            ORGANISM: Neisseria meningitidis US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                Query Match 97.8%;
Best Local Similarity 98.2%;
Matches 531; Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540 W 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 W 592
                                                                                                                                                                                                                          SEQ ID NO 2
LENGIH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                    QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481 QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match

98.7%; Score 2720; DB 4;
Best Local Similarity 99.1%; Pred. No. 1.1e-202;
Matches 535; Conservative 1; Mismatches 4;
                                         Sequence 11, Application US/09669974

Patent No. 6333173

GENERAL INFORMATION:

APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Paul
APPLICANT: MOXON, E. Richard
FILE REPERBNCE: 065064/0128

CURRENT APPLICATION NOVEL SURFACE ANTIGEN
FILE REPERBNCE: 065064/0128

CURRENT APPLICATION NUMBER: US/09/669,974

CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12

PRIOR FILING DATE: 1997-12-12

SOFTWARE: PATENTING DATE: 1997-12-13

SOFTWARE: PATENTING DATE: 1997-12-12

FRIOR FILING DATE: 1997-12-12

SEQ ID NOS: 33

SOFTWARE: PATENTIN VEY: 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 2, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                TYPE: PRT
ORGANISM: Neisseria meningitidis
              RESULT 4
US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: NE
US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
```

59

Gaps

1;

Length 592; Indels 171

179

239

291

299

351

359

411

419

471

479

531

```
412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                            66 KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG 119
                                                                                                                                                                                                                                                                                                                                                                                                        INGDITVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 179
                                                                                                                                                                                                                                                                                9
                                                                                                                                                                                                                                                                                                 293 GKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6 EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANCOTGOADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASGRGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              479 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                 .;
8
                                                                                                                                                                                                                 Length 594;
                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                 20;
                                                                                                                                                                                                               91.1%; Score 2512; DB 3; 92.4%; Pred. No. 1.5e-186;
                                                                                                                                                                                                                                               Matches 501; Conservative 13; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:

APPLICANT: PEAK Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065044/0128
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PEUF
                     PCT/AU98/01031
           CURRENT FILLING DESCRIPTION NUMBER: PCT/AU98/0103
PRIOR PILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PPIOR FILING DATE: 1997_12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 9, Application US/09669974 Patent No. 6333173
                                                                                                                                                TYPE: PRT
ORGANISM: Neisseria meningitidis
        1999-08-19
                                                PRIOR APPLICATION NUMBER: GB
PRIOR FILING DATE: 1997-12-1
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 9
        CURRENT FILING DATE:
                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  - <u>&</u>
                                                                                                                                                                                US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            539
                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                  Best Local
                                                                                                                                   LENGTH:
                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                         d
                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                        쉽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                         111
                                                                                                                                                                                                                                                                                                                                                                                                                       179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              479
                                                                                                                                                                                                                                                                                                                                                                                                      KAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
                                                                                                                                                                                                                                                                                                                                            59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGOTGOADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNEE-QEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITL
                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                             Ή;
                                                                                                                                                                                                                                                                               DB 4; Length 592;
                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                           Query Match 97.8%; Score 2695.5; DB 4; Best Local Similarity 98.2%; Pred. No. 8.9e-201; Matches 531; Conservative 4; Mismatches 5;
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O65064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 9, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                             ; ORGANISM: Neisseria meningitidis
US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        540 W 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W 592
                                                                                                                                                                             SEQ ID NO 2
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                     09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                              TYPE: PRT
```

g δλ q

à

õ q ò g ŏ g ŏ g ò qq ò g ð 셤 ŏ ~염

```
Sequence 7, Application US/09669974 Patent No. 6333173
                                              meningitidis
                                                                                                     6
                                                                              90.4%;
larity 91.6%;
Conservative
    Patentin Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SVGYQW 540
                                             ; ORGANISM: Neisseria
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SVGYOW 594
                                                                                           Similarity
                                                                                           Best Local Sim
Matches 500;
                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-669-974-7
   SOFTWARE:
SEQ ID NO 7
LENGTH: 59
                                                                                                                                                 20
                                                                                                                                                                                                                                        169
                                                                                                                                                                                                                                                                                                          236
                                                                                                                                                                                                                                                                                                                                                                             349
                                                                                                                                                                                                                                                                                                                                                                                                                        409
                                                                                                                                                                                                                                                                                                                                                                                                                                               416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                   116
                                                                                                                                                                                                                                                              176
                                                                                                                                                                                                                                                                                                                                                        596
                                                                                                                                                                                                                                                                                                                                                                                                  356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       535
                                    TYPE: PRT
                                                                                 Query Match
                                                                                                                            δλ
                                                                                                                                                g
                                                                                                                                                                       δλ
                                                                                                                                                                                             d
                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                  óγ
                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QQ
                                                                                                                                                                                                                   Ω
                                                                                                                                                  .;
                                                                                                                                                                                                                                                                                                                                292
                                                                                                                                                                                                                                                                                                                                                        299
                                                                                                                                                                                                                                                                                                                                                                                                                                           PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                 KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG 119
                                                                                                                                                                                                                                                             120 INGDITVHLNGIGSTLTDTLLNTGATINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 179
                                                                                                                                                                                                                                                                                                                                                                                                 ASCKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS 359
                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592
                                                                                                                                                                         65
                                                                                                                                                                     6 EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL
                                                                                                                                                                                                                                                                          GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                       GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                 VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                 8
                                                                                                                            Length 594;
                                                                                                                                                 Indels
                                                                                                                                                 20;
                                                                                                                          tch 91.1%; Score 2512; DB 4; al Similarity 92.4%; Pred. No. 1.5e-186; 501; Conservative 13; Mismatches 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: DEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SUFFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEO ID NOS: 33
            9726398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 7, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                             TYPE: PRT
ORGANISM: Neisseria meningitidis
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9
PRIOR FILING DATE: 1997-12-12
                               NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 9
LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                539 QW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                - <u>%</u>
                                                                                                     US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 9
US-09-377-155-7
                                                                                                                          Query Match
Best Local Si
Matches 501
                                                                                                                                                                                           54
                                                                                                                                                                                                                 99
                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   413
                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                      ò
                                                                                                                                                                                          g
                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                      οp
                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
```

```
Э,
                                                                                                                               108
                                                                                                                                                                            115
                                                                                                                                                                                                                                                             175
                                                                                                                                                                                                                                                                                                      228
                                                                                                                                                                                                                                                                                                                                                  235
                                                                                                                                                                                                                                                                                                                                                                                           288
                                                                                                                                                                                                                                                                                                                                                                                                                                     295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD 415
                                                                                         61
                                                                                                                                                                      62 GDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAK
||||||||
| SDNLKIKQNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAK
                                                                                                                                                                                                                                                                                    GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                  GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       469 GALNVGSKDŢNKPVRIŢNVAPGVKEGDVŢNVAQLKGVAQNLANRIDNVDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                     2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                        KLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                            8;
Length 594;
Score 2493; DB 3;
Pred. No. 4.4e-185;
9; Mismatches 29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
APPLICANT: PERK, Ian Richard Anselm
APPLICANT: BINNINGS. Michael Paul
APPLICANT: JENNINGS. Michael Paul
APPLICANT: MOXON, E. Richard
ITTLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR FLING DATE: 1999-08-19
PRIOR FLING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
```

÷;

```
348
                                                                                       408
                                                                                                                                                                                                                                                                                                                                                                                                                                                   468
                                                                                                                                                                                       171
                                                                                                                                                                                                                                                 231
                                                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                                                                                351
                                                                                                                                                                                                                                                                                                                                                                                                                       411
                                                                                                                                                                                                                                                              409 KVISGNVSPSKGKMDETVVINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                 GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                                                                                         NFAKETAGTNGDTTVHLNG1GSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                 WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                          EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                         TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                        KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        471 AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                          12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12;
                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      89.9%; Score 2478; DB 3; Length 90.4%; Pred. No. 6.5e-184; Ive 10; Mismatches 31; Indels
               Length
             ; Score 2478; DB 3;
; Pred. No. 6.5e-184;
11; Mismatches 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: MOXON, E. Richard
ITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR PILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 13, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: Neisseria meningitidis
             89.9%;
90.2%;
                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 531 GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ||||||||
589 GTSASVGYQW 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEC ID NOS: 33
SOFTWARE: Patentin Ver.
SEC ID NO 13
LENGTH: 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity
Matches 497; Conserv
                            Similarity
                                        496;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                     289
                                                                                                                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                                                                                                                        352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 412
                                                                                                                                62
                                                                                                                                                                                         112
                                                                                                                                                                                                                                                 172
                                                                                                                                                                                                                                                                                                        232
             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: PRT
                              Local
                                          Matches
                                                                                                qq
                                                                                                                                                           q
                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                QΥ
                                                                                                                                                                                         ΩŸ
                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                  Οy
                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                 175
                                                                                                                                                                                                                                                                                                        235
                                                                                                                                                                                                                                                                                                                                     288
                                                                                                                                                                                                                                                                                                                                                                                                                        355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 415
                                                                                                                                                                                                      295
                                                                                                                                                                                                                                                                                                                                                                                             348
                                                                                                                                                                                                                                                                                                                                                                                                                                                     408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NATDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 534
                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV1S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD
                                                                                                                             2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                      GDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAK
                                                                                                                                                                                                                                                 ETAGINGDITVHLNGIGSTLIDILLNIGATINVINDNVIDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                       GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                        KLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                 NVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS

    -ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                    Gaps
                                                                                                   .;
8
                                                                     Length 594;
                                                                                                   Indels
                                                                                                   29;
                                                                     90.4%; Score 2493; DB 4;
91.6%; Pred. No. 4.4e-185;
iive 9; Mismatches 29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: DEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: MOXON, E. Richard Paul APPLICANT: MOXON, E. RICHARD G. CURRENT APPLICATION NUMBER: US/09/377,155 CURRENT FILING DATE: 1999-08-19 PRIOR APPLICATION NUMBER: PCT/AU98/01031 PRIOR APPLICATION NUMBER: GB 9726398.2 PRIOR PILING DATE: 1998-12-14 PRIOR PILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 5, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
             TYPE: PRT ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; ORGANISM: Neisseria meningitidis US-09-377-155-5
                                                                   Query Match 90.49
Best Local Similarity 91.6
Matches 500; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |||||||
SVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EQ ID NO 5
LENGTH: 598
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-377-155-5
LENGTH: 594
                               ; ORGANISM: NI
US-09-669-974-7
                                                                                                                                                           20
                                                                                                                                                                                                                                                                          169
                                                                                                                                                                                                                                                                                                                                                                                          289
                                                                                                                                                                                                                                                                                                                                                                                                                                                349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   469
                                                                                                                                                                                       62
                                                                                                                                                                                                                                               116
                                                                                                                                                                                                                                                                                                     176
                                                                                                                                                                                                                                                                                                                                    229
                                                                                                                                                                                                                                                                                                                                                               236
                                                                                                                                                                                                                                                                                                                                                                                                                       396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE:
SEQ ID NO 5
                                                                                                                                                           g
                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ÓΥ
                                                                                                                              ò
                                                                                                                                                                                       ò
                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                          QQ
                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ă
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
```

.. B

111 168 171 288

291

231

348

351 408 411 468 470

g

g οy g

δy

g

δ

ò

g

ò g ò q

QQ ò

ö

```
50 NATDDDDLYLEPVQRTAVVLSFRSDKEGTGEKEGTED-SNWAVYFDEKRVLKAGAITLKA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             112 NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                   EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                        412 VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                 ---NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                      TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2478; DB 4;
Pred. No. 6.5e-184;
); Mismatches 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFOGRATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: EB 9726398.2
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-669-974-13; Sequence 13, Application US/09669974; Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       89.9%;
90.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 90.4
Matches 497; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               531 GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: Pa
                                                                                                                                                                                                                                                                                     289
                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                    232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM:
                                               62
                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                               q
                                                                                                                                              QQ
                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                             Óγ
                                                                                                              òγ
                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ä
                                                                             408
                               412 VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          231
                                                                                                                                                                                                                                                                                                                                                                                                                       352 KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS 411
                                                                                                                                                                                                                                                                                     EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGOTGQADKFETV 291
                                                                                                                                                                                                                                                                                                                                                    292 TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                  WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                         NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
               NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atch 89.9%; Score 2478; DB 4; Length 598; cal Similarity 90.2%; Pred. No. 6.5e-184; 496; Conservative 11; Mismatches 31; Indels 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DEFLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: MOXON, EN Richard Full TILE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR PILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
SOFTWARE: PELING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 5, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GASASVGYQW 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-669-974-5
                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                                                                                                                                                                                                                      349
                                                                                                                                                                                                                                                                                                                                                                                                                                                      601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
```

ω .,

Gaps

61

õ

œ

348

350

410

468

```
GWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVI
                                                                              KEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFET
                                                                                                KEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFET
                                                                                                                      VISGINVIFASGKGTIATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS
                                                                                                                                                             GKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTL
                                                                                                                                                                                                    SVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAG
                                                                                                                                                                                                                                                                                                                                   2003, 09:35:53
                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                                                                                                                                                                                   October
                                                                                                                                                                                                                                                                                             FGASASVGYQW
                                                                                                                                                                                                                                                                                                                                 Search completed: Octobook Job time: 16.4407 secs
                                                                                                                                                                                                                      469
                                                          229
                                                                                231
                                                                                                  289
                                                                                                                      291
                                                                                                                                          349
                                                                                                                                                                               409
                                                                                                                                                                                                    411
                                                                                                                                                                                                                                          470
                                                                                                                                                                                                                                                             529
                                                                                                                                                                                                                                                                                 530
                                       171
                                                                                                                                                             351
                                                                                                                                                                                                                                          δ
                   qq
                                                       g
                                                                              ŏ
                                                                                                  g
                                                                                                                                        g
                                                                                                                                                             ŏ
                                                                                                                                                                                g
                                                                                                                                                                                                   ò
                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                 δλ
                                       δy
                                                                                                                     ò
                                                                                                                                         348
                                                                                                                                                                                                                      468
                                                                                                                                                                                                                                         470
                                                                                                                                                                                                                                                             528
                                                                                                                                                                                                                                                                                 530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       168
                                                          228
                                                                                231
                                                                                                  288
                                                                                                                                                             351
                                                                                                                                                                               408
                                                                                                                                                                                                   411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61 AGDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKG 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              171
                                                                                                                      291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             09
                                      TSGTNVTFASCKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                       KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                             VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
 GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                      EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 599,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   88.2%; Score 2430.5; DB 3
88.6%; Pred. No. 3.1e-180;
iive 14; Mismatches 34;
                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DEBNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, MICHAEL
FILE REFERENCE: 065064/0128
FILE REFERENCE: 065064/0128
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                         Sequence 15, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Local Similarity 88.6%
Matches 488; Conservative
                                                                                                                                                                                                                                                                                                                        GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                   US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOFTWARE:
SEQ ID NO 15
                                                         169
                                                                                                  229
                                                                                                                                                            292
                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                            469
                                                                                                                                                                                                                                                                                                   529
                                                                                                                                                                                                                                                                                                                        531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109
                   109
                                       112
                                                                             172
                                                                                                                     232
                                                                                                                                         289
                                                                                                                                                                                                                     409
                                                                                                                                                                                                                                         412
                                                                                                                                                                                                                                                                                471
62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                       g
                                                                                                                                                          ò
                                                                                                                                                                          q
                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               쉽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                 g
                                                        g
                                                                             à
                                                                                                g
                                                                                                                     ò
                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
 ç
                                       ò
```

```
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
```

- protein search, using sw model OM protein Run on:

October 6, 2003, 09:13:35 ; Search time 15.4576 Seconds (without alignments) 3359.577 Million cell updates/sec

Title: Perfect score: Sequence:

US-09-771-382-33 2757 1 NNEEQEEXLYLHPVQRTVAV.....TASGNSRGHFGASASVGYQW 540

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

283308 seqs, 96168682 residues Searched:

283308 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

PIR_76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:* Database

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

,		ж			SUMMARIES	
	Score	Query Match	Length	DB	ID	Description
-	2727		591	5	G81133	adhesin NMB0992 [i
7	2212	80.2	592	~	A81888	probable surface f
ო	451		298	~	164138	
4	393	14.3	2059	~	D82671	surface protein XF
S	369.5		1107	7	AC0976	probable autotrans
9	365.5		1190	7	A82615	surface protein XF
7	358	13.0	1588	~	A86036	probable adhesin Z
ထ	358		1588	~	н91188	probable adhesin E
6	331.5	12.0	658	7	AH0110	
10	228.5	8.3	1536	7	A43855	
11	212	7.7	2020	~	C48399	ABC-type transport
12	209	7.6	2273	~	T09083	hemagglutinin/hemo
13	207	7.5	1910	7	AF0394	probable adhesin h
14	206.5	7.5	4919	~	T31105	hypothetical prote
15	203	7.4	936	~	140711	
16	200.5	7.3	1477	7	B43855	high-molecular-wei
17	199.5	7.2	5291	7	F90696	hypothetical prote
18	198.5	7.2	1109	~	A56143	surface-array prot
19	195	7.1	582	~	F90961	flagellin [importe
20	195	7.1	585	7	F85809	hypothetical prote
21	195	7.1	1004		C82672	surface-exposed on
22	195	7.1	1461		E90696	hypothetical prote
23	194.5	7.1	1035		AD3203	autotransporter pr
24	193	7.0	5188		B85547	probable RTX famil
25	192.5	7.0	1428		AC2224	hypothetical prote
56	9	7.0	1635		AI0452	=
27	191	6.9	1461		A85547	hypothetical prote
28	æ	6.9	2249		A41477	
29	188.5	6.8	4152		T31102	entous }

301 352 361

g ò

οy

SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG 420

30 188 6.8 906 2 C85739 31 188 6.8 1011 2 F90879 32 187.5 6.8 1651 2 JC1440 34 186.5 6.8 1430 2 AH1396 35 186.5 6.8 1530 2 AH1396 36 185 6.7 365 2 AH3486 39 184 6.7 2514 2 F81045 39 184 6.7 1361 2 T03415 41 183 6.6 2554 2 AH3486 42 182.5 6.6 1205 2 AH2486 44 182.5 6.6 1577 2 AB140 44 182.5 6.6 3017 2 AH2486 45 182.5 6.6 351 2 B98047	hypothetical prote	probable BigA-like	outer membrane pro	surface array prot	probable autotrans	peptidoglycan anch	cell surface prote	hypothetical prote	hemagglutinin/hemo	S-layer protein -	hemolysin A - Serr	extracellular seri	hypothetical prote	hemolysin A precur	probable invasin Y	hypothetical prote
@@@@@@\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	C85739	F90879	JC1340	140614	AF0351	AH1396	AB3486	G64964	F81045	T03415	A28182	AB3528	AH2486	A35140	AB0480	B98047
@@@@@@\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7	~	~	~	~	~	7	~	~	~	7	7	7	~	~	7
	906	1011	1651	920	1430	1530	365	1091	2514	1361	1608	2554	1205	1577	3013	2551
30 31 32 32 33 34 34 35 36 36 36 36 36 36 37 38 38 38 38 38 39 41 185 39 41 182 54 42 182 54 43 182 54 64 64 64 64 64 64 64 64 64 6	8.9	9	8.9	8.9	8.9	8.9	6.7	6.7	6.7	6.7	6.7	9.9	9.9	9.9	9.9	9.9
01100000000000000000000000000000000000	188	188	187.5	187	186.5	186.5	185	185	185	184	183.5	183	182.5	182.5	182.5	182
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

ALIGNMENTS

RESULT 1 G81133 adhesin NMB0992 [imp C;Species: Neisseria C;Date: 31 Mar-2000 C;Accession: G8113	NMB090 ss: Ne: 31-Maj	RESULT 1 GB1133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C.Species: Neisseria meningitidis C.Species: 31-mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
R; Tettel Hickey, ri, H.;	in, H E.K.; Qin, 1	R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Elsen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Tri, H.; Qin, H.; Vanathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M.
A; Author A; Title: A; Refere	s: Grand	Screme 207, 1009-1015, 2000. Atthors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A; Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A; Reference number: A81000; MUID:20175755; PMID:10710307
A; Accession: G81133 A; Status: preliminary A; Molecule type: DNA	ion: (: pre. le typ	81133 Liminary ee: DNA
A; Kesidues: A; Cross-ref A; Experimen	refer refer menta	A;Residues: 1-591 <tet> A;Cross-references: GB:AE002450; GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722 A;Experimental source: serogroup B, strain MC58</tet>
A;Gene: NMB0992	NMB09	32
Query Match Best Local Matches 53	Match local :	Ouery Match 98.9%; Score 2727; DB 2; Length 591; Best Local Similarity 99.3%; Pred. No. 4.6e-133; Matches 536; Conservative 1; Mismatches 3; Indels 0; Gaps 0;
Qy	1	
qq	52	NNEEQEEDLYLDPVQRTVAVLIVNSDKEGTGEKEKVEENSDWAVYFNEKGVLTAREITLK 111
Οy	61	
Dp	112	AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGT 171
Qy	121	NGDTIVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
qq	172	NGDTTVHLNGIGSTLTDTLLNTGATINVTNDRVTDDEKKRAASVKDVLNAGWNIKGVKPG 231
Qy	181	
Db	232	TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG 291
Qy	241	KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA 300
qq	292	

```
A;Molecule type: DNA
A;Residues: 1-1107 <PAR>
A;Residues: 1-1107 <PAR>
A;Cross-references: GB:AL513382; PIDN:CAD03303.1; PID:g16504923; GSPDB:GN00176
C;Genetics:
A;Gene: sapB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Cispecies: Xylella fastidiosa
Cispecies: Xylella fastidiosa
Cispecies: Xylella fastidiosa
Cispecies: Alexacionous desquence_revision 20-Aug-2000 #text_change 20-Aug-2000
Cispecession: A82615
R:anonymous, The Xylella fastidiosa Consortium of the Organization for Nucle
Nature 406, 151-157, 2000
A;Tille: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; MUID:20365717; PMID:10910347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1010
                                                                                                                                                                      34
                                                                                                                                                                                                                                 91
                                                                                                                                                                                                                                                                425
                                                                                                                                                                                                                                                                                              138
                                                                                                                                                                                                                                                                                                                           485
                                                                                                                                                                                                                                                                                                                                                                                                                                                      595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         447
                                                                                                                                                                                                  382
                                                                                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    503
                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A82615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                      ò
                                                                                                                                                                                                  рp
                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                         óγ
                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                       δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              q_0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              probable autotransporter sap8 [imported] - Salmonella enterica subsp. enterica serovar Typhi Sispecies: Salmonella enterica serovar Typhi Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 18-Nov-2002 C;Accession: AC0976 C;Accession: AC076 C;Accession: AC076 C;Accession: AC0976 C;Accession: AC0976 C;Accession: AC076 C;Accession: AC0976 A;Accession: AC0976 A;Accession: AC0976 A;Acteus: preliminary
                                                                                                                                                                                                                                 1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1859 TDDMRHEINNIEDVFKITKGDSASSVKGMGVNAMAIGTNAAVSGTESVALGK---NTNVS 1915
                                                                                                                                                       SGFNAGDKVISHVAVGMADTDAVNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGA 1738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1739 TGSKAIAAGVGTQASGEGAAAVGSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRG 1798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1948 VAAGTADTDAVNVSQLNQGLITAKQYTDGMVGNLRRETSGGVAAAIATANLPQAYVQGRG 2007
                                                                                                       30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  340
                                                                                                                                                                                                                                                              HGNKVNITSDTKGLNFAKETA----GTNGDTTVHLNGI-----GSTLTDTLLNTGA--T 145
                                                                                                                                                                                                                                                                                                                           146 TNVT----NDNVTDDEKKRAASVKDVLNAGWNI------KGVKPGTTASDNVD---- 188
                                                                                                                                                                                                                                                                                                                                                                                        ---FVRTYDTVEFLSADTK-----TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLV 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           373 AGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITN 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LDS-----KAVAGSSGKVISGNVSPSKGKMDETVNIN 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR----AGIAQAIATAGLVQAYLPGKS 488
                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---TVS-----CKDDQGNITVMYDVNVG-DALNVNQL----QNSGWN
                                                                                                                                     21 LIVNSDKEGAGEKEKVEENSDWAVYFNE-KGVLTARE----ITLKAGDNLKIKQNGT---
                                                                                                                                                                                                  ----NFTYSLKKDLTDLT-----TEKLSFSA
                                                                                                                                                                                                                               1444 KNTDGNLTISKSGDSNDVVFNLSEDLKEKSITVGNTQLDKDGVKVSSNVLLDSNELVITS
                                                                                                                                                                                                                                                                                                                                             TGQ---ADKFETVTSGTNV-----TFASGKGTTA--------
                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                     14.3%; Score 393; DB 2; Length 2059; 23.9%; Pred. No. 2.2e-12; ive 95; Mismatches 217; Indels 230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGKDKGEN-----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTT----
                                                                                                    170; Conservative
                                                                                       Similarity
A;Contents: annotation C;Genetics.
                                         A; Gene: XF1529
                                                                                                                                                                                                                                                                                                                                                                                        189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        489
                                                                                                                                                                                                  73
                                                                                                                                                                                                                                                             98
                                                                                                                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             34.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                308
                                                                        Query Match
                                                                                        Local
                                                                                        Best Loc
Matches
                                                                                                                                                                                                                          QQ
                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                     ç
                                                                                                                                                                 g
                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                     ద
                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

```
950 QLKASEAGSVRYETNADGSVNYSVLNLGDGSGGTTRIGNVSAAVNDTDAVNYAQLKRSVE 1009
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EANTYIDQKMGEMNSKIKGIENKMSGGIASAMAMAGLPQAYAPGANMTSIAGGTFNGESA 1069
                                                 28;
                                                                                                                                                                                                                                                 484
                                                                                                                                                                                                                                                                                                                                                  --INT-SITNLGTDALSWDDEEGAFSASHGTSGTNKITNVAAGEIASDSTDAINGSQLYE 541
                                                                                                                                                                                                                                                                                                                                                                                                      236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            424
                                                                                                                                                                                                 EKL-----SFSAH--GNKVNITSDTKGLNFAKETAGTNG-----DTTVHLNGIGSTLTD 137
                                                                                                                                                                                                                                                                                                  TLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFV---RTYD 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TAVGYDAVASGAGCLALGQNSSSSIEGSIALGSGSTSNRAITTGIRETSATSDGVVIGYN 654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TIDRELLGALSLGTDGESYRQITNVADGSEAQDAVIVRQLQNAIGAVTTTPTKYYHANST 714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90
                                                                                                                                                                                                                                                                                                                                                                                                                                   |||::|:
EKVDQNT-----TDIAANTTNITQNSTAIENLNTSVSDINTSITGETD
                                                                                                                                                                                                                                 -----EGTA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         : | | : | | | | | | EEDSLAVGTDSLAMGAKTIVNADAGIGIGLNTLVWADAINGIAIGSNARANHANSIAMGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ------NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAG
                                                                                                                                                                                                                                                                                                                                                                                                   T------VEFLSADTKTTTVN------VESKDNGKKTEVKIGAKTSVIKEKDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----QLQNSGWNLDSK-----AVAGSSGKVISGNVSPSKGKMDETVNINAG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VTDAQVSRNTQSITNLNTQVSNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSVSLGAGADAP - - - - - - TLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVA
                                                                                                   EKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGT----NFTYSLKKDLTDLTSVGT
Length 1107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TNVTFASGKGTTA----TVSKDDQG-----NITVMYDVNVGDALNVN----
                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ------DIATSMTPQF--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -TAKEVIDAVNKA----GWRMKTTTANGQTGQ-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                       Best Local Similarity 21.6%; Pred. No. 1.6e-11;
Matches 164; Conservative 100; Mismatches 211;
DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVTGKDK------GENGSSTDEG-------
Score 369.5; DB 2
Pred. No. 1.6e-11;
13.4%;
21.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              375 -NNIEITRNGKNI-----
```

Nucleotide Seq

```
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Óγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                    A; Rolecule type: DNA
A; Residues: 1-1190 (SIM)
A; Residues: 1-1190 (SIM)
A; Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1; GSPDB:GN001
A; Experimental source: strain 9a5c
B; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; Briones, M.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H Briones, M.R.S.; Bueno, M.R.; Renger, T. Renger, T. Ritajima, J.P.; Kriager, J.E.; Kriager, B.E.; Laign Chado, M.A.; Madelra, A.M.B.N.; Madelra, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.P. Rodriques, V.; Rosa, A.J. de M.; de Rosa Jr. V. V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | : | : | : | : | : | CGNYNGDGATGTRSIAVGVGTLASA----EGATAVGSGAAASGKGSTAIGRNAVASADGS 916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AVYFNEKGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSV-GTEKLSFSAHGNK 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENG-SSTDEGEGLVTAKEVI 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NVGDALNVNQL----QNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V--NITSDIKGLNFAKETAG----TNGDTT---VHLNGIGSTLTDTLLNTGATTNVTND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVTDDEKKRAASVKDV-----LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       971 T--DAVNLRQLDRVAQDANRYVDNKIESLSEGQTF------VKVNSLNN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----SATP----IAAGVDATAIGVGATASGADSIAMGNKASASADNAVAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ------RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---AGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      818 KITN----VAAGTADTDAVNLSQLNTAMAGSGAK-----SVHYYSTYD-----GGTO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  380 TRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV-----DGDALNVGSK----KDNKPV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13.3%; Score 365.5; DB 2
27.0%; Pred. No. 2.9e-11;
tive 68; Mismatches 209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NSRGHFGASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity 27.08
Matches 150; Conservative
                                     A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Gene: XF1981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
```

```
C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001
C;Accession: A86636
C;Accession: A86636
C;Accession: A86636
C;Accession: A86636
C;Accession: A86636
C;Accession: A86636
Nur: L:, Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apoda Nature 409, 529-533, 2001
A;Title: Genome sequence of enterohemorrhagic Escherichia coli 0157:H7.
A;Reference number: A86480; MUID:21074935; PMID:11206551
A;Accession: A86036
A;Residues: L-1588 <STO>
A;Residues: 1-1588 <STO>
A;Residues: 1-1588 <STO>
A;Residues: 1-1588 csto
A;Cossreferences: GB:AE005174; NID:912518349; PIDN:AAGS8749.1; GSPDB:GN00145; UWGP: C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probable adhesin ECs4480 [similarity] - Escherichia coli (strain O157:H7, substrain C;Species: Escherichia coli (c;Species: Escherichia coli (c;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 02-Nov-2001 (c;Cacession: H91188) (c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1309 --GQLKVTDAQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGV 1365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1082 NSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGE 1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | : | | | | | STEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAI 1253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                158 KKRAASVKD-----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         70 NGTNFTYSLKKDLTDLFSVGTEKLSFSAHGNKVN-ITSDTKGLNFAKETAGTNGDTTVHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGI ------TDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKDNGK----KTEVKIGAKTSVIKEK-----DGKLVTGKDKGE------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    246 -NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1254 GNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGGSAD-----TDAVNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    298 TFASGKGTTATVSKDDQGNITVM-----YDVNVGDAL-----NVNQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    335 QNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITRN---GKN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -IDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              445 VAQLKGVAQ-----NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13.0%; Score 358; DB 2; Length 1588; 24.5%; Pred. No. 1e-10; ive 79; Mismatches 228; Indels 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   494 GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Simi
Matches 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: Z5029
```

U

δ

probable adhesin 25029 [imported] - Escherichia coli (strain 0157:H7, substrain EDL933) C;Species: Escherichia coli

×

S

```
nontypeable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Residues: 1-1536 <BAR>
A; Rossidues: 08:008876; GB:M84616; NID:9475770; PIDN:AAA20527.1; PID:9475771
A; Note: sequence inconsistent with the nucleotide translation
A; Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
                                          22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100
                                                                                                                                                                                                                                                                                                                                                                                                                                 341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   143
                                                                                                                                                                                                                                                                                                                                             281
                                                                                                                                                                                                                                                                                                                                                                                       ----- KYSNASNTS 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KSISNQTNAYTNQRYSELKQDLRKQNSVLSAGIASAMSMASLTQPYTSGSSMTTIGAASY 615
                                                                                                                                                                      167
                                                                                                                                                                                                                                                        221
                                                                                                                                                                                                                                                                                                   364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KGVAQN----LNNRIDNVDGNAR-----AGIAQAIATAGLVQAYLPGKSMMAIGGGTY 497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         144 ATT---NVTN--DNVTDDEKKRAASVKDVLNAGWNIKGV--------KPGTTASD- 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        high-molecular-weight surface-exposed protein HMM1 - Haemophilus influenzae C.Species: Haemophilus influenzae C.Species: Haemophilus influenzae C.C.Date: 10-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 08-Oct-1999 C.S.Accession: A43855 Rarenkamp, S.J.; Leininger, E. Infect. Immun. 60, 1302-1313, 1992 Affile: Cloning, expression, and DNA sequence analysis of genes encoding no detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SG-----TVSVGNTAT-----GETRTVSNVADG------LQATDAVNLRQLDG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                50 GVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTK
                                                                                                                 | :|:: :: | | | :|| GAVTSQANSIALG-AASINTVGAQSSYSAYALTAPQASVGELGIG-TALGNR-KITGVAA
                                                                                                                                                                      110 GLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTN--DNVTDDEKKRAASVKDV
                                                                                                                                                                                                                                                                                                                                             222 KIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGO
                                                                                                                                                                                                                                                                                                                                                                                                                               282 TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDI--ATSMTPQFSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      399 VSLGAGADAP-----TLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            274 G-----SASSDAVNVAQLTAVGDQVQQN-----TANITSLGGRVTTIE----GSMASI
                                                                                                                                                                                                                                                           168 LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT-----EV
                                                                                                                                                                                                                                                                                                   318 ANGG-GVKYFHANSTQPDSV-----ASGTNSVAIGPASLASGNAALASGAGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   51 VLTAREITLKAGDNLKIKQNGTNFT-YSLKKDLTDLTSVGTEKLSFSAHGN.....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 145;
Length 658;
                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101 -KVNITSDTKGLNFAKETAGT--NGDTTVHLNG----IGSTL---
                                                                                                                                                                                                                                                                                                                                                                                   365 AIG--DGAAASADGSVAIGQGSGDNGRGVENYIG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Reference number: A43855; MUID:92192797; PMID:1548058
A;Accession: A43855
Score 331.5; DB 2;
Pred. No. 7.7e-10;
                                          74; Mismatches 204;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches 215;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8.3%; Score 228.5; DB 2 22.1%; Pred. No. 0.00044;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        83;
12.0%;
                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
                      Best Local Sim
Matches 132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local 9
    Query Match
                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                            g
                                                                                                                                                                    ò
                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ω
                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (strain C092) C.Species: Yersinia pestis (c.Species: Yersinia pestis (c.Species: Versinia pestis (c.Species: Oz-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001 C.Saccession: AH0110 R:Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.; Il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrell, A.; Title: Genome sequence of Yersinia pestis, the causative agent of plague.

A. Reference number: AB0001; MUID:21470413; PMID:11586360
A. Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | : | | : | | 1
1194 STEEDSLAVGTDSLAMGAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAI 1253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --GQLKVTDAQVSQNTQ-SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGV 1365
                                                                                                                                                                                                                                                                                                                                                                   1142 LLGALSIGDDGKYRQIIN-----VADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHAN 1193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GNGSTTTRGAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSAD----TDAVNV 1308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1366 DASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATD 1425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1426 AVNVAQLKSSEAGGVRYDTKADG---SIDYSNITLGG-GNGGTTRISNVSAGVNNNDVVN 1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NATNAMIEQNTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFNDASAQGVGATAIGY 1081
             A;Molecule type: DNA
A;Residues: 1-1588 <HAY>
A;Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154
A;Experimental source: strain 0157:H7, substrain RIMD 0509952
C;Genetics:
                                                                                                                                                                                                                                                      70 NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVN-ITSDTKGLNFAKETAGTNGDTTVHL 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 246 -NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNV 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      298 TFASGKGTTATVSKDDQGNITVM------YDVNVGDAL------NVNQL 334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        335 QNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---DETVNINAGNNIEITRN---GKN--- 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -IDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type: DNA
A; Residues: 1-658 < KUR>
A; Cross-references: GB:ALS90842; PIDN:CAC89747.1; PID:g15978974; GSPDB:GN00175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VAQLKGVAQ------NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG 493
                                                                                                                                                                                                                                                                                                                                        158 KKRAASVKD-----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE
                                                                                                                                                                  ;; Score 358; DB 2; Length 1588;
;; Pred. No. 1e-10;
79; Mismatches 228; Indels 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SKDNGK - - - - KTEVKIGAKTSVIKEK - - - - - - - DGKLVTGKDKGE - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                                                                                                                  13.0%;
ilarity 24.5%;
Conservative 7
                                                                                                                                                                                        Similarity
                                                                                                                                                                  Query Match
Best Local Simil
Matches 144; C
                                                                                                                          A; Gene: ECs4480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: YPO0902
                                                                                                                                                                                                                                                                                              1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1542
                                                                                                                                                                                                                                                                                                                                        129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C; Genetics
                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       염
                                                                                                                                                                                                                                                        å
                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               φ.
Θ
```

Dp	: : : : : : : : : : : :	Qy 17 TVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGTNFTY 76
٥y	S	Db 195 TVALEGVSADGATKWQYNHNGELVITGDNATVNNNG 230
qq	942 DNSKNLSITTNSSSTYRTIISGNITNKNGDLNITNEGSDTEMQIGGDVSQKEGNL 996	Qy 77 SLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKG 110
ολ	238 VIGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQAD 286	Db 231KTTVDGKDSTGTEINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTWTVTDPES 288
qq	997 TISSDKINITKQITIKAGVDGENSDSDATNNANLTIKT 1034	Qy 111LNPAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDN 152
οy		Db 289 MGIQIDGDKAIVNNEGESTITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEINGNNGK 348
Ор	KELKLTQDLNISGFNKAEIT	QY 153 VIDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEF-LSADTKTTTVNVE 211
οy	342 DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSL 401	Db 349 VIQDGDLDVSGGGHGI-DITGDSATVDNKGTMTVTDPESIGIQVDGDQAVVNNE 401
අු	1090 DGHKVTLHSKVETSGSNNNTEDSSDNNAGLTIDAKNVTVNNNIT-SHKAVSI 1140	Qy 212 SKD NGKKTEVKIGAKTSVIKEKDGKLVTGKD 247
Qγ	402 GAGADAPTLSVDGDALNVGSKKDNKFVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 459	Db 402 GESAITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEIAGNNGKVIQDGDLDVSG 457
QQ	1141 SATSGEITTKT-GTTINATTGNVEITAQTGSILGGIESSSGSVTLTATEGALAV 1193	Qy 248SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 287
οy	460 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDG 513	ONKGTMTVTDPESIGIQIDGDQAIVNNEG
QQ	1194 SNISGNIVTVTANSGALTTLAGSTIKGTESVTTSSQSGDIGGTISGGTVEVKATESLTTQ 1253	Qy 288 FETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG 338
οy	514 GWWIIKGTASGNS 526	Db 511TQINGNDAT-ANNSGKTTVDGKDSTGTKIAGNIGIVNLDGSLTVTGGAHGVENIG 564
qq	1254 SNSKIKATTGEANVTSATGTIGGTISGNT 1282	Qy 339 WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATS 391
		::: : : : : Db 565 DNGTVNNKGDIVVSDTGSIGVLINGGATVSNTGDVNVS-NEATGFSITTINGGKVSLAGS 623
RESULT C48399		Ov 342 M-PPOFSSVSIGAGADAPTISVBGDAI.NVGSKKDNKPVRTT 431
ABC-type	e transport protein ydbA.2 - Escherichia coli (strain K-12)	
C; Date	19-Nov-1993 #sequence_revision 16-Oct-1998 #text_change 01-Mar-2002	024 MQVGDFSIGVDLNGNNNSVILMANDLNVVGQNAIGINVSGDANIVNILGNVLVDNDAIMD
C; Acce. R; Moszt	Sion: C48399; D04891; H04891 r, I.; Glaser, P.; Danchin, A.	Qy 432 NVAPGVKEGDVINVAQLKGVAQN-LNNRIDNV-DGNARAGIAQAIATAG 478
Biochi A; Title	de 73, 1361-1374, 1991:	Db 684 NAAEYFEDPSVGINVYGSDNNVTLDGKLTVVSDSEVTSRQSNLFDGSAEKTSG 736
A; Refe. A; Acces		Qy 479 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGWII-518
A: Mole	ule type: DNA	Db 737 LVVIGDGNTVNMNGGLELIGEKNALADGSQVTSLRTGYSYTSVIVVSGESSVYLNGDTTI 796
A; Cros	-references: 404 (B:055081; NID:93041754	Qy 519 KG 520
A, Expe	Amenical Source: Strain A-12 sequence inconsistent with the nucleotide translation	Db 797 SG 798
A;Note R;Blat(sequence extracted from NCBI backbone (NCBIN:88089, NCBIP:88090) ner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; Rilev, M.; Cd	
.A.; Rose, D.		RESULT 12
A; Titl	: The complete genome sequence of Escherichia coli K-12.	hemagglutinin/hemolysin-related protein NMB1214 [imported] - Neisseria meningitidis (
A; Acce	Sion: D64891	N'AILELMALE Nammes: promable secreteur protein C;Species: Neisseria meningitidis
A; Mole	s: nucleic acid sequence not snown; translation not snown ule type: DNA	C;Date: <u>li-Jun-1999</u> #sequence_revision li-Jun-1999 #text_cnange ly-Jan-2001 C;Accession: T09083; B81109
A;Resi A;Cros	<pre>ues: 1-839,'LDLPLYFQTSVIT' <bla1> -references: GB:AE000237; GB:U00096; NID:g1787665; PIDN:AAC74483.1; PID:g1787668;</bla1></pre>	R;Simpson, N.J.; Spratt, B.G. submitted to the EMBL Data Library, October 1997
A; Expe. A; Acces	imental source: strain K-12, substrain MG1655 sion: H64891	A;Reference number: 216558 A:Accession: T09083
A;Statu A;Moled	A;Status: nucleic acid sequence not shown; translation not shown A;Molecule type: DNA	A;Status: preliminary; translated from GB/EMBL/DDBJ A:Molecule type: DNA
A; Resid	79767 L2. GIG	A; Residues: 1-2273 <sim> A; Residues: 1-2273 <sim> A; Residues: 1-273 <sim> A; Residues: 1-273</sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim></sim>
A; Expe	tal source: strain K-12, substrain MG1655	:
A; Generics: A; Gene: ydb	Genetics: Genetydda. Grart Andan. Gwc	<pre>K;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Flaischmann, R.D.; Dougherty, B.</pre>
1000	212	11, n.; Ulli, n.; Vallatlievali, J.; Gili, J.; Scallato, V.; Masignali, V.; Fizza, M. Science 287, 1809-1815, 2000
Query M Best Lo Matches	Query Match 7.7%; Score 212; DB 2; Length 2020; Best Local Similarity 24.2%; Pred. No. 0.0044; Matches 160; Conservative 70; Mismatches 216; Indels 216; Gaps 37;	A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A;Reference number: A811006; MuID:20175755; PMID:10710307

```
-----DVYFTNVELNATAGNVSIYAETKTALSTSLNAVLSLGGNN 1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .004 IENVN-----IETNNGNFTTNGIT-----STWLSGVNVSANGVDITSNSTGTGGIVLDN 1052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----WLIGKA-----FNTTQGAGIGFRANSSLSVDGNIILK 1239
                                                                                                                                                                                                                                                                                                                                                                                                        203 TKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEV 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Cross-references: EMBL: AF057696; NID: 93929021; PID: 93929023; PIDN: AAC79761.1 C; Genetics:
       A; Cross-references: GB: AL590842; PIDN: CAC92482.1; PID: 915981183; GSPDB: GN00175
                                                                                                                                                                                       49 KGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITS-- 106
                                                                                                                                                                                                                                                                                 --DTKGLNFAKETAGT-----NGDTTVHLNGI-GS---TLTDTLLNTGATTNVT 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   48 EKGVLTAREITLKAGDNLKIKQNGTNFTYSLK-KDLTDLTSVGTEKLSFSAHGNKVNITS 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hypothetical protein 2 - Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Accession: T31105
R;Ward, C.K.; Lumbley, S.R.; Latimer, J.L.; Cope, L.D.; Hansen, E.J.
J. Bacteriol. 180, 6013-6022, 1998
A;Fitle: Haemophilus ducreyi secretes a filamentous hemagglutinin-like prote A;Fitle: Haemophilus ducreyi secretes a filamentous hemagglutinin-like prote A;Accession: T31105
A;Accession: T31105
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Residues: 1-4919 <WAR>
                                                                                                                                                                                                                        854 HISLIAVNGGKEIGSTVSVDYANIIAKNGDFNLNITGMKGSPFNNATITANNISMNGNIT
                                                                                                                                                                                                                                                                                                                                                                            -NDNV--TDDEKKRAASVKDVLNAGWNIKGV----KPGTTASDNVDFVRTYDTVEFLSAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDAVNKAGWRMKTT----TANGQTGQADKFETVTSGTNVT-----FASGKGTTATVSKDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    314 QGNITVMYDVNV-----UDALNVNQLQNSGWNLDSKAVAGSSGK----VISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1053 TNILTTVGDINTIVTNSSGKGIWIKSNSTLNS--NKDITLVGVSAGQNEGVIIQGSSDAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              362 KGKMDETVNI----NAGN-----NIEITRNGKNIDIATSMTPQFSSVSLGAGAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---ARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGY---SSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    407 APTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                            7.5%; Score 207; DB 2; Length 1910;
23.1%; Pred. No. 0.0074;
tive 67; Mismatches 180; Indels 172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 4919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 7.5%; Score 206.5; DB 2; Best Local Similarity 22.1%; Pred. No. 0.026; Matches 147; Conservative 73; Mismatches 213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -
-
-
                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1161 -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1201 SIKAQNG---
                                                                                                                      Best_Local Similarity
Matches 126; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1240 GETEG 1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTASG 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 466
                                                                                                                                                                                                                                                                                 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         520
                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Gene: 1spA2
                              C;Genetics:
A;Gene: hmwA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 14
                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     á
                                                                                                                                                                                           ð
                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οχ
                                                                       GB:AE002098; NID:g7226446; PIDN:AAF41596.1; PID:g722645
B, strain MC58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probable adhesin hmwA [imported] - Yersinia pestis (strain C092)
C; Species: Yersinia pestis
C; Species: Versinia pestis
C; Species: Versinia pestis
C; Species: Versinia pestis
C; Species: Versinia pestis
C; Accession: AF0394
R; Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. Redeno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.; Il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrell, Nature 413, 523-527, 2001
A; Reference number: AB0001; WUID:21470413; PMID:11586360
A; Recession: AF0394
A; Status: preliminary
A; Status: Preliminary
A; Residues: 1-1910 <KUR>
                                                                                                                                                                                                                                                                                                                                                                                                 | : | : | : | | : | | 1062 SRSETRSNQNEQGSVRNIGRVAGIXLTGRQNGSVLLDAGNNIVLTASELTNQSEDGQT-- 1119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : | | | | | : : | | | | : : | | | | 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1002 NRGGLIAGREALILNAQNIKNLOGDLOGKNIFAAAGSDITNTGSIGAENALLLKASNNIE 1061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1394 VVNTVMGAVDAVKAVQTVGKSKNSRVNAMAAANALNKGVDSGVALYNAARNPKKAAGQGI 1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              104 ITSDTKGLNFAKETAGTNGDTT-VHLNG--IGSTLTDT----LLNTGATTNVTNDNVTDD 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                             157 EKKRAASVKDVLNAGWNIKGVKPGTTASDNVDF-------VRTYDTVEF- 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNN----IEITRNGKNIDIATSM- 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          393 -------GDAL 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----NVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSM-MAIGGG- 495
                                                                                                                                                                                                                                                                               47 NEKGVLTAREITLKAGDNLKIKQ---NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVN 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243 KGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ------TYWYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       199 LSADTKTTTVNVESKDNGKK----TEVKIGAKTSVIKEKDGKLVTGKD------
                                                                                                                                                                                    7.6%; Score 209; DB 2; Length 2273;
20.8%; Pred. No. 0.0073;
iive 78; Mismatches 238; Indels 188;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    418 NV----GSKKDNKPVRITNVAPGVKEGDVT-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1571 ETAYRNSHIGSKDSQTAIESGGDTVIKG---GQLKG 1603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --TYR-GEAGYAIGYSSISDGGNWIIKGTASGNSRG 528
A.Accession: B81109
A.Molecule type: DNA
A.Residues: 1-2273 <TET>
A.Cross-references: GB:AE002469; GB
A.Experimental source: serogroup B,
C.Genetics:
A.Gene: pspA; NMB1214
                                                                                                                                                                                  Query Match 7.69
Best Local Similarity 20.89
Matches 132; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 13
                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
```

32;

protein.

1003

913

853

27;

313

OY SIZE STANDARD STAN	234DGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ 234DGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQ 1	QY 436 GYREGDVINVAQLKGVAQNLANRIDVAGIARGIAQAIATAGLVQAYLPGKSMMAIGGG 495 Db 733 NAKLTDVTSIIIDGDAKITLGHA-GTAGTDVSKVSMIDARAL 773 QY 496 TYRGEAGYAIGYSSISDGGWIIKGTASGNS 526 Db 774KAGLTFDASAITLGANATIKGGSGADS 800 Search completed: October 6, 2003, 09:33:28 Job time: 18.4576 secs	
DD 477 DKASVLAHKLTLNISNDVSLNNQSKLSANNLKIKKVRDLNLNNSELSANNLTLNTSN 533 1 1 1 1 1 1 1 1 1	653 ADIKAVNLTLNDTTELT-SADIALITYVVEANDISALIEVALGALISALIANTERALGILA 238		SULT 15 70711 PB protein - Camp Species: Campylob Date: 16-409-1991 Accession: 14071: Date: 270 Tille: Segmental Reference number Residues: 1936 Cross-references Genetics: Gen

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

October 6, 2003, 09:06:20 ; Search time 8.33898 Seconds (without alignments) 3045.266 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-09-771-382-33 2757 1 NNEEQEEXLYLHPVQRTVAV......TASGNSRGHFGASASVGYQW 540

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

127863 seqs, 47026705 residues Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

SwissProt_41:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

		æ			SUMMARIES		
Result No.	Score	Ouery Match	Length	DB	OI.	Description	u o
٦	212	٠.		-	DBA		
7		6.9	2249	-	OMPA_RICRI		rickettsia
m	187.5		1953	Н	BIGA_SALTY		salmonella
4	185	٠	1654	٦	OMPB_RICRI		outer mem
S	183.5	•	1608	-	HLYA_SERMA		serratia ma
9	182.5		1039	П	AG43_ECOLI	-	escherichia
	182.5		1577	7	HLYA_PROMI	_	proteus mir
ω	181.5	•	1645	Н	OMPB_RICTY	н	outer mem
6	177.5	6.4	1007	П	Y741_CHLMU		chlamydia m
10	177	6.4	917	٦	HXA3_HAEIN		haemophilus
11	177	٠	1655	П	OMPB_RICCN		outer mem
12	176.5		1569	П	YPJA_ECOLI	es	escherichia
13	174		1567	٦	ICEN_XANCT		xanthomonas
14	173.5		2334	П	WAPA_BACSU	_	bacillus su
15	173	•	933	-	SLAP_CAMFE		campylobact
16	170.5		1656	Н	OMPB_RICJA	н	outer mem
17	170.5	٠	2021	7	OMPA_RICCN		rickettsia
18	169.5		928	-	HXA2_HAEIN	_	haemophilus
19	169	6.1	918	-	YMJB_CAEEL	_	caenorhabdi
20		•	1643	Н	OMPB_RICPR	н	outer mem
21	163.5		1861	٦	APU_THETU	ų	amylopull
22			2660	Н	YEEJ_ECO57	_	escherichia
23	161.5		1286	-	AIDA_ECOLI	-	escherichia
24	161		550	-	FLIC_SHIFL		shigella fl
25	161		1148	Н	ICEK_PSESX	030611 pse	pseudomonas
56	160		1300	-	120K_RICRI	P14914 ric	rickettsia
27	വ		642	Н	FLID_CAMJE		campylobact
28	S		2358	-	YEEJ_ECOLI	_	escherichia
29	158.5	٠	1025		SLAP_CAUCR	8	caulobacter
30	വ	5.7	3178	П	-1	24	caenorhabdi
31	157	5.7	737	Н	ALYS_ENTFA	Ĭ	enterococcu
32	157	5.7	928	-	-1	-	chlamydia p
33	157	•	1153	-	PVDB_PLAKN		plasmodium

P04949 escherichia 033479 pseudomonas P06620 pseudomonas Q06974 salmonella P4969 haemophilus Q06968 salmonella P18481 streptococc P15345 caulobacter Q48253 helicobacter Q5255 helicobacter Q	
FLIC_BCOLI ICEV_PSESX ICEN_PSESY FLIC_SALON IGAQ_HAEIN IGA2_HAEIN FLIC_SALBE FLIC_SALBE FLIC_SALBE FLIC_SALBE FLIC_CAUCR VAC3 HELPY	YG4A_YEAST
497 1196 1200 507 1694 1702 507 537 954 1310	817
$ \frac{1}{2} $	5.5
156 155 155 154.5 153 152.5 152.5 152.5	151.5
88888884444 45978601284	45

ALTGNMENTS

YDBA E	RESULT 1 YDBA ECOLI
ID	YDBA_ECOLI STANDARD; PRT; 2003 AA.
	356; P76857; F
	01-FEB-1994 (Rel. 28, Created)
	16-OCT-2001 (Rel. 40, Last sequence update)
	16-OCT-2001 (Rel. 40, Last annotation update)
	, Hypothetical protein ydbA.
	YDBA OR B1401/B1405.
SO	
38	bacteria; Froteobacteria; gammaproteobacteria; Enterobacteriales;
3 8	Enterobacteriaceae; Escherichia.
Y 2	CallaxID=302;
Z 0	[1]
, a	STRAILWEIZ / MG1655:
2 ≿	MEDLINE=97426617; PubMed=9278503;
RA	Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
RA	Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
RA S	Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
¥ E	Mau B., Snao I.;
7 7	The comprete genomie sequence of Escherichia coll K-12.";
N N	0.141.0
RP	SEQUENCE FROM N.A.
RC	STRAIN=K12;
ΚX	
RA	Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh T.,
KA 6	
2 A	Makade C. Nakamira V. Nachimoto H. Nichio V. Ochima P. Caito N
R P	Navade 3., Maramuta 1., Mashimoto n., Mishiro 1., Oshima 1., Saito M., Sambel G., Seki Y., Sivasundaram S., Tagami H., Takeda J.,
RA	Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.;
RT	"A 570-kb DNA sequence of the Escherichia coli K-12 genome
R.I	corresponding to the 28.0-40.1 min region on the linkage map.";
Z :	DNA Res. 3:363-377(1996).
7 Z Z Z	(3) Spoitface of 464-2003 from N A
2 2	SECOND OF THE PROPERTY OF THE
2 2	MEDLINE=92190338: PubMed=1665988:
RA	Moszer I., Glaser P., Danchin A.;
RT	S inse
RT:	Escherichia coli K-12.";
Z S	Biochimie 73:1361-1374(1991).
္ဌ မ	
2 8	-!- CAUTION: THIS I SA CONCEPTION, TRANSLATION, THE GENE COLING FOR
3 5	THIS PROTEIN IS INTERROFTED BY A HIBRID ISSUC ELEMENT RETWEEN AMINO ACTOS 839 AND 840.
8 8	The state of the s
ည	duced th
၁ ဗ	Detween the SWISS Institute of Bioinformatics and the EMBL outstation the Rusopean Bioinformatics Institute There are no restrictions on i
3 2	use by non-profit institutions as indicated is in no w
88	modified and this statement is not removed. Usage by and for commercial
ပ္ပ	ires a license agreement (See h
ပ္ပ	or send an email to license@isb-sib.ch).

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@liberine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              57 ITLKAGDNLKIKQNGTN---FTYSLKKDLTDLTSVGTEKLS-----FSAHGNKVNIT 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192 GNIDGGGIITVKTDAAINGT-----IGNTNALATVNVGAGTATLGGAVIKATTTKLTN 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VKIGAKT----SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKT 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S--DTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNV---TDDEKKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTE
                                                                                                                                                                       Anderson B.E., McDonald G.A., Jones D.C., Regnery R.L.;
"A protective protein antigen of Rickettsia rickettsii has tandemly repeated, near-identical sequences.";
Infect. Immun. 58:2760-2769(1990).
-i. FUNCTION: ELICITS PROTECTIVE IMMUNITY.
-i. SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A SLAYER WITH HESAGONAL SYMMETRY.
Outer membrane protein A precursor (190 kDa antigen) (Cell surface antigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    208; Indels 152;
                                                             Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBL_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13 X APPROXIMATE TANDEM REPEATS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1; Length 2249;
                                                                                                                                                                                                                                                                                     PTM: GLYCOSYLATED (PROBABLE).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TIGREAMS; TIGROLA114; autoirans barl; 3.
Antigen; Repeat; Signal; Cell wall; S-layer; Glycoprotein.
SIGNAL 1 28 POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       80 TYPE I (INCOMPLETE).
224333 MW; A9D6646C089DF087 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OUTER MEMBRANE PROTEIN A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; Pred. No. 0.049; 64; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A (TYPE 1).
B (TYPE 11).
C (TYPE 11).
D (TYPE 11).
E (TYPE 11).
G (TYPE 11).
H (TYPE 1).
J (TYPE 1).
J (TYPE 1).
K (TYPE 1).
K (TYPE 1).
M (TYPE 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.9%; Score 189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PIR; A414//; A414//.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
Pfam; PF03797; Autotransporter; 1.
                                                                                                                                                              MEDLINE=90354033; PubMed=2117568;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; M31227; AAA26380.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22249
1180
286
358
430
577
577
724
724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1093
1165
1180
                                                  Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PIR; A41477; A41477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
nes 122; Conserv
                                                                                                                               FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             161
                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                          37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      289 MGIQIDGDKAIVNNEGESTITHNGGTGTQINGDDATANNNGKTTVDGKDSTGTEINGNNGK 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      349 VIQD-----GDLDVSGGGHGI-DITGDSATVDNKGTMTVTDPESIGIQVDGDQAVVNNE 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : | | | : | | | GESAITNGGIGTQINGDDATANNNGKTTV----DGKDSTGTEIAGNNGKVIQDGDLDVSG 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----SSTDEGEGLVTAKE-----VIDA----VNKAGWRMKTTTANGQTGQADK 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FETVTSGTNVTFASGKGTTATVSKDD-----QGNITVMYDVNVGDALNV----NQLQNSG 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WN--LDSK-----AVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATS 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M-TPQFS-----SVSLGA-----GADAPTLSVDGDALNV---GSKKDNKPVRIT 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          624 MQVGDFSTGVDLNGNNNSVTLAAKDLKVVGQKATGINVSGDANTVNITGNVLVDKDKTAD 683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LV------QYSISDGGNWAIGGGTYRGEAGYAI------GYSSISDGGNWII 518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                737 LVVIGDGNTVNMNGGLELIGEKNALADGSQVTSLRTGYSYTSVIVVSGESSVYLNGDTTI 796
                                                                                                                                                                                                                                                                       9/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     - TQINGNDAT-ANNSGKTTVDGKDSTGTKIAGNIGI---VNLDGSLTVTGGAHGVENIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   565 DNGTVNNKGDIVVSDTGSIGVLINGEGATVSNTGDVNVS-NEATGFSITTNSGKVSLAGS
                                                                                                                                                                                                                                                                      17 TVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGTNFTY
                                                                                                                                                                                                                                                                                         |||: |::| || : || || : |:|
TVALEGVSAD--GA------TKWQYNHNGELVIT------GDNATVNNNG-----
                                                                                                                                                                                                                                                                                                                                  SLKKDLTDLTSVGTE-----KLSFSAHGNKVNITSDT----KG------
                                                                                                                                                                                                                                                                                                                                                      --KTTVDGKDSTGTEINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPES
                                                                                                                                                                                                                                                                                                                                                                                                                                                           VTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEF-LSADTKTTTVNVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SKD------NGKKTEVKIGAKTSVIKEKDGKLVTGKD-KGENG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGHGIDITGDSATVDNKGTWTVTDPESIGIQIDGDQAIVNNEG----STITNGGTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NVA-----PGV-----KEGDVTNVAQLKGVAQN-LNNRIDNV-DGNARAGIAQAIATAG
                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                           DB 1; Length 2003;
                                                                                                                                             89 I -> V (IN REF. 2).
95 I -> V (IN REF. 2).
205949 MW; B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                         70; Mismatches 216;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                          0.003;
                                                                                                                                                                                                           7.7%; Score 212;
                                                                                                                               Complete proteome
                                                                                                                                                                                                                           Pred. No.
           EMBL, AE000237; AAC74483.1; ALT_SEQ. EMBL, D90778; BAA15009.1; ALT_SEQ. EMBL, D90778; BAA15009.1; ALT_SEQ. EMBL, D90779; BAA18880.1; ALT_SEQ. EMBL, D90779; BAA18881.1; ALT_SEQ. EMBL, X62880; NOT_ANNOTATED_CDS. EcoGene; EG11307; ydbA. Hypothetical protein; Complete proteom CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (Rel. 14, Created)
(Rel. 14, Last sequ
(Rel. 40, Last anno
                                                                                                                                                                                                                          24.28;
                                                                                                                                                                                                                                       Matches 160; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                            2003 AA;
                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SG 798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KG 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-APR-1990 (
01-APR-1990 (
16-OCT-2001 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OMPA_RICRI
P15921;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               519
                                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                            SEQUENCE
                                                                                                                                                              CONFLICT
                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OMPA_RICRI
ID OMPA_R
AC P15921
DT 01-APR
DT 01-APR
DT 16-OCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ద
    ð
                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              요
                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                              ð
```

CC use by non-profit institutions as long as its content is in no way CC modified and this statement is not removed. Usage by and for commercial CC entities requires a license agreement (See http://www.isb-sib.ch/announce/CC or send an email to license@isb-sib.ch).	33696; P 08859; P 606; AAZ	Stydene; SG10437; bigA. Virulence; Repeat; Signal; Co SIGNAL 1 27 CHAIN 28 1953	DOMAIN 101 252 REPEAT 101 103 REPEAT 104 113	REPEAT 114 122 REPEAT 123 133 REPEAT 134 144 REPEAT 145 155	REPEAT REPEAT REPEAT REPEAT	REPEAT 200 210 REPEAT 211 221 REPEAT 222 233 REPEAT 233 243	REPEAT 244 252 15 (CONFLICT 207 207 D ->	FT CONFLICT 514 514 A -> R (IN REF. 3). FT CONFLICT 1698 1698 D -> N (IN REF. 1). FT CONFLICT 1795 1798 QYLE -> ITLQ (IN REF. 1). FT CONFLICT 1836 1837 SA -> T (IN REF. 1). SQ SEQUENCE 1953 AA; 200150 MW; 611B3F1C954D91AE CRC64;	Query Match 6.8%; Score 187.5; DB 1; Length 1953; Best Local Similarity 23.1%; Pred. No. 0.049; Matches 126; Conservative 63; Mismatches 195; Indels 161; Gaps 29;	QY 62 GDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGTN 121	OY 122 GDTTVHLNGIGSTLT-DTLLNTGATTNVTNDNVTDDEKKRAASVKDVLN 169	170 AG-WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTVNVESKDNGKKTEVKIGAKTS	Db 529 EGNQTISGGAVGTRIDGD	:	Qy 285 ADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNS 337	EKNTFKNKGDIDVSLNGTGALVS-GDMSQVTLDGDINVV	338 GWNLDSKAVAGSSGKV-ISGNVSPSKGKMDETVNINAGNNIEITRNGK-NI :	666 FSSATGVSVSGDSNAVDITGNVNISADYGQDDLAAGAPPLTGVVVGGNGNTVTLNGALNI	Qy 387DIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVT 443	Qy 444 NVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLP 485
296 ISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGALDNTGNANNGIVT 276 TTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDA	Db 349 FTGNSTVTGNVGNTNALATVNVGAGLLQVQGGVVKANTINLT-DNASAVTETNPVVVTGA 407	Qy 375SMTPQFSSVSLGA 403	QY 404 GADAPTLSVDGDALNVGSKRDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVD 463 I <t< td=""><td>QY 464 GNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWI 517 </td><td>OY 518 IKGTAS 523 : 601 IKATTT 606</td><td>SULT 3 SA_SALTY</td><td>BIGA_SALTY P25927; P259</td><td></td><td>OS Salmonella typhimurium. OC Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales; OC Enterobacteriaceae; Salmonella. OX NCBI_TaxID=602;</td><td></td><td>KT "Salmonella typhimurium rhs homolog."; RL Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases. RN [2] RP SECHENCE FROM N A</td><td></td><td></td><td>RA Waterston R., Wilson R.K.; RT "Complete genome sequence of Salmonella enterica serovar Typhimurium Pr rm.".</td><td></td><td></td><td>MEDLINE-91100301; PubMed-1987123; Wu J Y . Slegel L.M., Kredich N.M.;</td><td></td><td><pre>RT coractor."; RL J. Bacteriol. 173:325-333(1991). CC -!- CAUTION: Ref.3 sequence differs from that shown due to frameshifts CC in positions 414 and 732.</pre></td><td>This betw</td></t<>	QY 464 GNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWI 517	OY 518 IKGTAS 523 : 601 IKATTT 606	SULT 3 SA_SALTY	BIGA_SALTY P25927; P259		OS Salmonella typhimurium. OC Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales; OC Enterobacteriaceae; Salmonella. OX NCBI_TaxID=602;		KT "Salmonella typhimurium rhs homolog."; RL Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases. RN [2] RP SECHENCE FROM N A			RA Waterston R., Wilson R.K.; RT "Complete genome sequence of Salmonella enterica serovar Typhimurium Pr rm.".			MEDLINE-91100301; PubMed-1987123; Wu J Y . Slegel L.M., Kredich N.M.;		<pre>RT coractor."; RL J. Bacteriol. 173:325-333(1991). CC -!- CAUTION: Ref.3 sequence differs from that shown due to frameshifts CC in positions 414 and 732.</pre>	This betw

```
g
                                                                                                                                                                                                                                                                                                                                                     οp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                          qq
                                                                                                                                   Db
                                                                                                                                                     ·δ
                                                                                                                                                                                         g
                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                                                                                                                                                                                                                         δý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
                        qq
                                                    QY
                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
--GKSMMAIGGGTYRGEAG----YAI----GYSSISDGGNWIIKGTASGNSRGHFGA 532
               :|| | || :| :| :| | || 835 TYNALLMADGEGTSIENKGDITSHGVYSVIRADNGSEVSNSGDILVYATSSNSSEDRAAI 894
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                        30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) (Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ø
                                                                                                                                                                                                                                                                                                                                                                                               Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsia rickettsii is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor."; Mol. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ΒY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6.7%; Score 185; DB 1; Length 1654;
22.5%; Pred. No. 0.054;
ve 77; Mismatches 255; Indels 174;
                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120 kDa SURFACE-EXPOSED PROTEIN. 32 kDa BETA PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1181 1188 POLY-THR.
1654 AA; 168184 MW; D7AB70FB7087F618 CRC64;
                                                                                                                                                  PRT; 1654 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pfam; PF03797; Autotransporter; 1.
TIGRFAMS; TIGR01414; autotrans_barl; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=92167802; PubMed=1724278;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-90136087; PubMed-2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [2]
SEQUENCE OF 279-1654 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Antigen; S-layer; Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; X16353; CAA34403.1; -.
                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                       Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR; S18227; S18227
                                                                              895 TRASG 899
                                                                                                                                                                                                                                                                                                                                            [1]
SEQUENCE FROM N.A.
                                                      SASVG 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1334
                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=783;
                                                                                                                                                  OMPB_RICRI
                                                    533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOMAIN
                                                                                                                                                  a
δ
                         원
                                                    ò
```

30;

Gaps

22.58;

Similarity

Best Local Sim Matches 147;

Conservative

```
DGTGRLVLLSKHAA--AINFNITG------SLGGNLKGVIEFNIVA----VD 308
                                                                                                                                                                                                                                                                                     309 GQLTANAGAANAVIGTNNGAGRAAGFVVSVDNGKVATIDGQVYAKDNVIQSAN---ATGQ 365
                                                                                                                                                                                                                                                                                                                                               -----DKGENGS----- 2TDEGEGLVTAKEVIDAV----- 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----TNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGK-----SMM 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGSATNPLAEINFGSKGVNVDTVL 717
                                                                                     FTYSLKKDLTDLT--SVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGI 131
                                                                                                                                                                     132 GSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVR 191
                                                                                                                                                                                                                                                            192 TYDTVEFLSADTKTTTVN-----VESKDNGKKTEV--KIGAKTSVIKEKDGKLVTGK 241
                                                                                                                                                                                                                                                                                                                                                                               366 VNFRHIVDVGADGTTAFKTAASKVTITQDSNFGNTDFG-NLAAQIKVPNAITLTGNFTGD 424
                                                                                                                                                                                                                                                                                                                                                                                                                                  ----NKAGWRMKTTTANG--QTGQADKFETVTSGTNVTFASGKGT-----TATVSKD 312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DQGNITVMYDVNVGDALN--VNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM---- 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----DIATSWIPQFSSV 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540 TLANDAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTSTQNNIVVDFDLAIA-TDQTGVV 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             400 SLGAGADAPTLSVDG------DALNVGSKK---DNKPVRITNVAPGVKEGDV-- 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DASSLTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNVAINELVIG-NDGAVQF 657
VQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGTN 73
                                                                                                                           212 GTLNVTNGFIQVSNKSFATVKAINIADGQGIIFNTDANNANTLNLQA---GGTTINFTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   hemolysin determinant of Serratia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. SHLA REQUIRES SHLB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteriol, 170:3177-3188(1988).
FUNCTION: BACTERIAL HEMOLXSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    491 AIGGGTYRGEAGYA-----IGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT; 1608 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A., AND SEQUENCE OF 31-40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUBCELLULAR LOCATION: Outer membrane.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Poole K., Schiebel E., Braun V.; "Molecular characterization of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=88257037; PubMed=3290200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria; Gam
Enterobacteriaceae; Serratia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Serratia marcescens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        marcescens.";
J. Bacteriol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-SN8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HLYA_SERMA
                                          156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         599
  14
                                                                                     74
                                                                                                                                                                                                                  569
                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                    267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HLYA_SERMA
```

```
P75614; P76360; P97241; Q46771;
                                                                                                       NCBI_TaxID=562;
                                                                                                                                                                                                                                                        STRAIN-K12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENE NAME
    This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1001 -VRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTGSIDAANGINVNVKKDAIYQGTALNG 1059
                                                                                                                                                                                                                     29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          889 VTRPVERAVGKAAKLDATGVINDIGGIGAPNVGLDIGAQGGSSEKRSSSSQAVVSSVQAG 948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----NRIDNVDGNARAGIAQAIATAG 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         784 TKIGGGFYYTGGIDKLGSGVEAGYENNKTQAQSSKAITSGSDVKGNLT----INARDKLT 839
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               331 VNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIAT 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      840 QQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI------GANVDYSA 888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           391 SMTPQFSSVSLGA------GADAPTLSVDGDALNVGSKK--DNKPVRLTNVAPG 436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LVQAYLPGKSMMAIG----GGTYRCEAGYAIGYSSISDGGNW-----IIKGTASGN 525
                                                                                                                                                                                                                                                                                                                                                                                                                                       -----NSDWAVYFNEKGVLTAREITLKAGDNLKIKQNG
                                                                                                                                                                                                                                                        : | | : : : | | 506 VHAQRDLTIDADNQIQVGVQKTANAKAVRDDKTSWGGIGGGDNKNN--SNRREISHASEL
                                                                                                                                                                                                                                                                                                                                                                             GWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKD-NGKKT----EVKIGA
                                                                                                                                                                                                                                                                                                                                                                                                   619 AFNI-----TSSSHKADNSYQSSTASELKSDTNLTLVSHKDADVIGSQVASGGELSVES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------TVSKDDQGNITVMYDVNVGDALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             949 SIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSEAAANRQDEQSRDTR-----GSAG
                                                                                                                                                                                                                                                                                                                                 AGTNGDTTVHLNG-IGSTLTDTLL--NTGATTNVTNDNVTDDEKKRAASVKDVLNA----
                                                                                                                                                                                                                                                                                                                                                       564 --TSGG-TLRLNGQQGVTITGSKARGQKGGEVTATHGGLRID--NALSTTVDKIDARTGT
                                                                                                                                                                                                                                                                                                                                                                                                                         KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVT----AKEVIDAVNKAGWRM-----K
                                                                                                                                                                                                                                                                                     TNFTYSLKKDLTDLTSVGTEKLS------FSAHGNKVNITSDTKGLNFAKET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----TANGQTGQADKFETVTSGTNVTFASGKGTTA----
                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                    209;
                                                                                                                                                                                              Length 1608;
                                                                                                                                                                                                                    Indels
                                                                                                                                                            31 1608 HEMOLYSIN.
1608 AA; 165078 MW; D669B476FE7DAD51 CRC64;
                                                                                                                                                                                            Score 183.5; DB 1;
Pred. No. 0.062;
73; Mismatches 241;
 SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ¥
                                                                                                                                       Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        V----KEGDV----TNVAQLKGVAQNLN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                EMBL; M22618; AAA50323.1; -.
                                                                                                                                                                                                       21.8%;
                                                                                                                                                                                                                                        GAGEKEKVEE-----
                                                                                                                                                                                                       Local Similarity 21.8 ses 146; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                || :|
GRGKTAVNA 1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIR; A28182; A28182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SRGHFGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AG43_ECOLI
ID AG43_ECOLI
                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                        29
                                                                                                                                                                                                                                                              146
                                                                                                                                                                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                                                                                                                                                                                          226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        437
                                                                                                                                                  SIGNAL
                                                                                                                                                                                                         Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 6
ð
                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         엄
                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LICON T., Aiba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Kasai H., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito N., Sampel G., Seki Y., Sawamoto Y., Horiuchi T., Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T.; Takeda J., Takemoto K., Wada C., "A 460-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEMS Microbiol. Lett. 149:115-120(1997).
-1- FUNCTION: CONTROLS COLONY FORM VARIATION AND AUTOAGGREGATION. MAY FUNCTION AS AN ADHESIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                properties of proteins encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN) ANCHORED TO THE INTEGRAL OUTER MEMBRANE PROTEIN (BETA CHAIN).
                                                                                                                                                                                                                Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "purification and N-terminal sequence of the alpha subunit of an 43, a unique protein complex associated with the outer membrane Escherichia coli.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Antigen 43, a phase-variable bipartite outer membrane protein, determines colony morphology and autoaggregation in Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -i- SUBCELLULAR LOCATION: Outer membrane-associated.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -!- SUBUNIT: HETERODIMER OF THE PERIPHERAL MEMBRANE PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Henderson I.R., Owen P.;
Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases.
01-FEB-1995 (Rel. 31, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Antigen 43 precursor (AG43) (Fluffing protein)
Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Henderson I.R., Meehan M., Owen P.;
"Antigen 43, a phase-variable bipartite outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=KI2 / EMG2;
MEDLINE=97443975; PubMed=9298646;
Link A.J., Robison K., Church G.M.;
Comparing the predicted and observed pro
in the genome of Escherichia coli K-12.";
Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=97251358; PubMed=9097040; Itoh T., Aiba H., Baba T., Fujita
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteriol, 171:3634-3640(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=89291704; Pubmed=2661530; Caffrey P., Owen P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=97257509; PubMed=9103983;
                                                                                                                                                                                                                                                     Enterobacteriaceae; Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY SEQUENCE OF 53-78.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         [3]
SEQUENCE FROM N.A.
STRAIN=ML 308-225;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=ML 308-225;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rite,
Gregor J., Dav.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 53-63
```

ø

```
HEMOLYSIN
                                                                                                                  -------AGDTATDTT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22.78; P1-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M30186; AAA25657.1; -.
                                                                                                                                                                                                                                                                                                                                    Bacteria, Proteobacteria, Ga
Enterobacteriaceae, Proteus.
NCBL_TaxID=584;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                           525
                                                                                                                                                                   461 TLSGKTVNN 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1577
                                                                                                                                                                                                                                                                                                   Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1577 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 139; Conserva
                                                                                                                                          517 IIKGTASGN
                                                                                                                                                                                                                                                                                                                           Proteus mirabilis.
             346 GG-RLD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINED
                                                                                                                                                                                                                                    HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            383
                                      397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIGNAL
                                                                                                                Q
                                                                                                                                                                                                                                                q
                                      ò
                                                               qq
                                                                                       ٥y
                                                                                                                                            ŏλ
                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ð
the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HGNKVNITSDTKGLNFAK-----GSTL 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDTLLNTGATTNV----TNDNVTDDEK---KRAASVKDVLN-AGWNIKGVKPGTTASDNV 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -YAGGDQTVHGHALDTTLNGGYQYVHNGGTASDTV--VNSDGWQIVKNGGVAGNTVN-Q 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGQADKFETVTSGTNVTFASG----KGTTATVSKDDQG-NITVMYDVNVGDALNVNQLQN 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DFVRT------YDTVEFLSADTKTTTVNVESKDNGKKTEVKIG-AKTSVIKEKDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --VNTGAEGGPDAENGDTGQFVRGDAVRTTIN----KNGRQIVRAEGTANTTVV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LVTGKDKGENGSSTDE----GEGLV----TAKEVIDAVNKAGWRM------KTTTANGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQF
                                                                                                                                                                                                                                                                    ATTICEN 43 BETA CHAIN.

K -> N (IN STRAIN ML 308-225).

SL -> FF (IN STRAIN ML 308-225).

T -> K (IN STRAIN ML 308-225).

W -> L (IN STRAIN ML 308-225).

V -> F (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

A -> T (IN STRAIN ML 308-225).

E -> V (IN STRAIN ML 308-225).

E -> V (IN STRAIN ML 308-225).

E -> Y (IN STRAIN ML 308-225).

E -> Y (IN STRAIN ML 308-225).

E -> Y (IN STRAIN ML 308-225).

C -> K (IN STRAIN ML 308-225).

C -> STRAIN ML 308-225).

C -> K (IN STRAIN ML 308-225).

C -> STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MNLIYNA (IN STRAIN ML 308-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1; Length 1039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                S -> P (IN STRAIN ML 308-225).
C -> S (IN STRAIN ML 308-225).
C -> S (IN STRAIN ML 308-225).
LNLVHTS -> MNLIYNA (IN STRAIN ML 308-225).
G -> LGA (IN STRAIN ML 308-225).
S -> T (IN STRAIN ML 308-225).
S -> I (IN STRAIN ML 308-225).
S -> I (IN STRAIN ML 308-225).
S -> I (IN STRAIN ML 308-225).
ETV -> TTT (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5170D647C8DEEBE0 CRC64;
                                                                                                                                                                                                                                                             ANTIGEN 43 ALPHA CHAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6.6%; Score 182.5; DB 1;
23.7%; Pred. No. 0.041;
Ive 68; Mismatches 154;
                                                                                                                                                                                                                                  Outer membrane; Signal; Complete proteome.
SIGNAL 1 52
                                                  or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                      TIGRFAMs; TIGR01414; autotrans_barl; 1.
                                                                         EMBL; AE000291; AAC75061.1; ALT_INIT.
EMBL; D900839; BAA15825.1; ALT_INIT.
EMBL; D90839; BAA15832.1; ALT_INIT.
EMBL; U24429; AAB47869.1; -
                                                                                                                                                      InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
InterPro; IPR004899; Pertactin.
                                                                                                                                                                                           Pfam; PF03797; Autotransporter; 1. Pfam; PF03212; Pertactin; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               106841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                          EcoGene; EG12686; flu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         855
888
888
1025
103
1039 AA;
                                                                                                                               HSSP; P07505; 1SRD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Sim
Matches 116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                        CHAIN
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONFLICT
                                                                                                                                                                                                                                                                                                                                                                           VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
SSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN 456
                                                                                                                                                                                            --VSMGNGG---VLLADSGAAVSGTRSDGK-----AFSIGGGQADALMLEKGSSFTLN 426
                                                                                                                                                                                                                                                                          457 NRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNW 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     32 EKEKVE-----ENSDWAVYFNEKGVLTAREITLKAGDNLKIKONGTNFTYSLKKDLTDL 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBCELLULAR LOCATION: Outer membrane.

MISCELLANDOUS: THE CONSEND AMPHIPATHIC DOMAINS IN SHLA AND HPMA MAY BE RESPONSIBLE FOR FORE FORMATION.

SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Uphoff T.S., Welch R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).
J. Bacteriol. 172:1206-1216(1990).
CELL MEMBRANES AND CAUSE CELL RUPFURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches 229; Indels 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 86 TSVG-TEKLSFSAHGNKVNITS------DTKGLNFAKETAG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EKEQIQQIGSQIDAKNNATLTATKGDVTLDAAKINAGNNLAINAN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           165869 MW; 175975E0C924B2D9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-AUG-1990 (Rel. 15, Created)
01-AUG-1990 (Rel. 15, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .6%; Score 182.5; DB
.7%; Pred. No. 0.068;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT; 1577 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A., AND SEQUENCE OF 30-43.
STRAIN=ISOlate 477-12;
MEDLINE-90170827; Pubmed-2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIR; A35140; A35140.
Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
```

us-09-771-382-33.rsp

^

```
JN0896;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               337
   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
405
                                                                                                                                                                                                                                                                                                                                                                       LTKKVTARDAIANLAN-LSNLE-TPNVGVEVGIK--------GGGSQQSQT 939
                                                                                                                                                                      T-----DEGEGLVT---AKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF 299
                                                                                                                                                                                                                                     QANKDVIFAGSDLKTIAGNASITGD-NVAFVSTENKKOTD--NTDTTISGGFS---YTGG 782
                                                                                                                                                                                                                                                                           441
                                                                                                                                                                                                                                                                                                                               GENIQHLAVNDSETSKT--DSLNVGIDVGVNLDYSGVTKPVKKAIEDGVNTTKPG-NNTD 898
                                                                                                                                                                                           569 AQQVTKIDDEKTSLAITGHAKEVEDKQYSAGFHITHTTNKNTSTETEQANSTISGANVDL 728
                                                                                                                                                                                                                 ASGKGTTATVS--KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGN 357
                                                      GAKLHANENVLVNAKDNINLNVQKTNNDKTVTDNHVMWGGIGGGQNKNNNNQQQVSHATO
                                                                                           442 VTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEA
                                                                                                                                                                                                                                                                                                          -----DAPTLSVDGDALNVGSKKD-----NKPVR-----ITNVAPGVKEGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15-JUL-1998 (Rel. 36, Last sequence update)
15-JUL-1998 (Rel. 36, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 KDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                  -----TNGDTTVHLN----GIGSTLTDTLL---NTGATTNVTNDN-----
                                                                            VTDDEKKRAASVKDVLNAGWNIKG -----VKPGTTASDNVDFVRTYDTVEFLSAD----
                                                                                                                          --TKTTTVNVESKDNGKKTEVK1GAKTSV1KEKD----GKLVTGKDK-----GE-NGSS
                                                                                                                                                                                                                                                              VSPSKGKMDETVNINAGNNIEITRN-GKNIDIATSMTPQFSSVSLGAGA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-94040787; PubMed-8224886; Hahn M.-J., Kim K.-K., Kim I., Chang W.-H.; "Cloning and sequence analysis of the gene encoding the crystalline surface layer protein of Rickettsia typhi."; Gene 133:129-133(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ching W.M., Carl M., Dasch G.A.; "Mapping of monoclonal antibody binding sites on CNBr fragments the S-layer protein antigens of Rickettsia typhi and Rickettsia prowazekii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID=785;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT; 1645 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PubMed=1370573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mol. Immunol. 29:95-105(1992)
                                                                                                                                                                                                                                                                                                                                                                                                  502 GYAIGYSSISDG 513
                                                                                                                                                                                                                                                                                                                                                                                                                     DSQAVSTSINAG 951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-Wilmington;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-Wilmington;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-92114896;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rickettsia typhi.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PARTIAL SEOUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antigen) (13
OMPB OR SLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OMPB_RICTY
P96989;
                                                                                                                                                                                                                                                                                                                               842
                                 120
                                                      191
                                                                            153
                                                                                                   551
                                                                                                                          203
                                                                                                                                                                      250
                                                                                                                                                                                                                000
                                                                                                                                                                                                                                       729
                                                                                                                                                                                                                                                             358
                                                                                                                                                                                                                                                                                                         406
                                                                                                                                                                                                                                                                                                                                                                                                                        940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OMPB_RICTY
                                                     g
                                                                                                 g
                                                                                                                                           g
                                                                                                                                                                   ò
                                                                                                                                                                                         g
                                                                                                                                                                                                               à
                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                          Op
                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                           ò
                                                                                                                         ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@ilensib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              381 RNGKNIDIATSM-----TPQFSSVSLGAGADAPTLSVDGD------A 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           : | |: | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSIQLDGSAII--TGDI--GNGAVNAALQDITLANDASKILTLSGANIIGANAGGAIHFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    53 TAREITLKAGDNLKIKQNGTNFTYSLKK---DLTDLTSVGTEKLSFSAHGNKVNITSDTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  201 ADTKTTTVNVESKD-----NGKKT----EVKIGAKTSVIKEKDGKLVTGKDKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTS-----GTNVTFASG-----KGTTATVSKDDQGNITVMYDVNVGDALNVNQLQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SGWNLDSKAVAGSSGKVISGNVSPSKGKMDET-------VNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      192 TTQEAPLTLGDNAKI-VNGANGILNITNGFVKVSDKTFAGIK-----TINI-GDNQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             110 GLNFAKETAGTN-----GDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     164 VKDVLNAGWNIKGV-KPGTTA------SDN-----VDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    341 GNAATISGQVYAKDIVIQSANAGGQVTFEHLVDVGLGGKTN-FKTADSKVII----TENA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                248 S--STDEG-----EGLVTAKEVIDAVNK---AGWRMKTTTANGQ--TGQADKFET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                   membrane protein of fickettsiae: identification of an avirulent mutant deficient in processing.";
Infect. immun. 60:159-165(1992).
-!- FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNGEN DURING INECTION.
-!- FUNCTION: THE 32 kDa BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCH-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY S-LAYER WITH HEXAGONAL SYMMETRY.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        189;
[3]
IDENTIFICATION OF CLEAVAGE SITE.
MEDLINE-92104668; PubMed=1729180;
Hackstadt T., Messer R., Cieplak W., Peacock M.G.;
"Evidence for proteolytic cleavage of the 120-kilodalton outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 1645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Antigen; S. layer; Transmendrane; Cell wall.

CHAIN
153 120 kDa SURRACE-EXPOSED PROTEIN.

CHAIN
154 1645 32 kDa BETA PEPTIDE.

CONFLICT
657 657 H -> N (IN REF. 2).

CONFLICT 842 842 V -> I (IN REF. 2).

CONFLICT 1071 1071 G -> A (IN REF. 2).

SEQUENCE 1645 AA; 169698 MW; OCB5641C7EB185EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              67; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 181.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
Pfam; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; L04661; AAB48987.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ouery Match 6.6
Best Local Similarity 22.5
Matches 138; Conservative
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                    190 VRTYDTVEFLSADTKT----TTVNVESKDNGKKTEVKIGAKTSVIKEKDG-----KLVTGKD 242
                                                         ---GENGSSTDEGEGLVTAKE----VIDAVNK 268
                                                                                                                                                                                 AGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDA 328
                                                                                                                                                                                                                     573 NGSAKETIITPGDTGPTDSSSSVDADADVEDTS--DTDSGIGDDD------GVSDT 620
                                                                                                                                                                                                                                                         ----SGNVSPSKGKMDETVNINAGN 375
                                                                                                                                                                                                                                                                                                                               376 Nİ-EITRNGKNIDIATSMTP----QFSSVSLGAGADAPTLS------VDGDAL 417
                                                                                                                                                                                                                                                                                                                                                                                                        ---RITNVAPGVKEGDVTNVAQLKGVAQNLNNRID 460
                                                                                                                                                                                                                                                                                                                                                                                                                                          NGNDSGKNTPVGDGGTPSGPDILAAVRKHLDTVYPGENGGSTERPLPAN---QNLGDIIH 792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NVDGNA-----GK----SAMAI 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DVEQNGSAKETVVSPYRGGGGNTSSPIGLA-SLLPATPSTPLMTTPRTNGKAAASSLMIK 851
---KG--SGTPTSSQSVDM 457
                                                                                                                               SGKTTSTEENGDPSGPDILAAVRKHLDTVYPGENGGST---EGPLPANQNLGNVIHDVEQ
                                                                                                                                                                                                                                                                                ESTNG-NNSGKTTSTEENGDPSGPDILAAVRKHLDTVYPGENGGSTEGPL--PANQNLGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Heme/hemopexin-binding protein precursor (Heme:hemopexin utilization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Haemophilus influenzae.
Bacteria; Proteobacteria; Gammaproteobacteria; Pasteurellales;
Pasteurellaceae; Haemophilus.
NCBI_TaxID=727;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BY SIMILARITY. HEME/HEMOPEXIN-BINDING PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-NTHI N182;
MEDLINE-95115556; PubMed=7815944;
MCDLINE-95115556; E., Latimer J.L., Slaughter C.A.,
Mueller-Eberhard U., Hansen E.J.;
"The 100 kDa haem:haemopexin-binding protein of Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGGTYRGEAGYAIGYSSISDGGNWIIKGTAS-----GNSRGH 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GGETQA-----KLVKNGGN--IPGETTLAELLPRLRGH 882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 influenzae: structure and localization.";
Mol. Microbiol. 13:863-813(1994).
-!- FUNCTION: BINDS HEME/HEMOPEXIN COMPLEXES.
-!- SUBCELLULAR LOCATION: Secreted.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Æ
                                                                                                                                                                                                                                                         329 LNVNQLQNSGWNLDSKAVAGSSGKVI----
120 QTPVINVNVNVGGTNVNIGDTNVS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; U08349; AAA74139.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pransport; Signal; Repeat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                        NVGSKKDNKPV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                            243 K-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HXA3_HAEIN
P45355;
                                                                                                                                              516
                                                                                                                                                                                  569
                                                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                            736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  793
                                                                                                                                                                                                                                                                                             621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       493
                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                      g
                                                                                                          δ
                                                                                                                                            g
                                                                                                                                                                                  ò
                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            || | : :: | | | : : | | | 569 ANGGTIQLISTIGANTKTLGR 628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            132 GSTLTDTLLNTGAT-TNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT-TASDNVDF 189
                                                                                                                           160 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYA-----IGYSSI 510
                                                                                                                                                    78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----KIKQNGTNFTYSL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :||| | | : : ::: | : | | | SSDWG---NRVDPLVSSKAGIESGGHLPSSVIINNKFRTCVAYGPWNPKENGPNYTPSAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      79 -KKDLTDLTSV--GTEKLSFSAHGNKVN----ITSDTKGLNFAKETAGTNGDTTVHLNGI
                                                       LINVGSKK-------DINKPVRIT-NVAPGVKEGDVTNVAQLKGVAQNLINNRI
                                                                                         629 FNVGSSKTILNAGDVAINELVMENDGSVHLTHNTYLITKTINAANQGKIIVAADPINTDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-MOPD / Nigg;
MEDLINE=201525; PubMed=10684935;
Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
Nead T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S.,
Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R.,
Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L.,
Elsen J., Fraser C.M.;
"Genome sequences Of Chlamydia trachomatis Mopn and Chlamydia
pneumoniae AR39";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --
--
-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels 219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
-!- SIMILARITY: BELONGS TO THE CHLAMYDIAL CPN0572/CT456/TC0741
FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 1007;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Chlamydiae; Chlamydiales; Chlamydiaceae; Chlamydia.
NCBI_TaxID=83560;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 52 1007 HYPOTHETICAL PROTEIN TC0741.
1007 AA; 104006 MW; 842800C0871B1518 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 1,....
Pred. No. 0.071;
....matches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TIGH, "CO741;
TIGH TC0741;
Hypothetical protein; Signal; Complete proteome.
51
POTENTIAL DEOFET
                                                                                                                                                                                                                                                                                                                                                                16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                                                                                                                                                                                                                                               PRT; 1007 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 177.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39 NSDWAVYFNEKGVLTAREITLKAGDNL---
                                                                                                                                                                                                                                                                                                                                                                                                                       Hypothetical protein TC0741 precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AE002342; AAF39550.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21.8%;
                                                                                                                                                                                                    511 SDGGNWIIKGTASG 524
                                                                                                                                                                                                                                      745 RSGGTSIVSGTVGG 758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Chlamydia muridarum.
Bacteria: Chlamydiae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           н81670; н81670.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN-MOPn / Nigg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 140;
                                                                                                                                                                                                                                                                                                                               Y741_CHLMU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                     417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                              Y741_CHLMU
                                                                                                                                                                                                                                                                                           RESULT 9
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                              g
                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                         g
                                                                                                                         ò
                                                                                                                                                                                                    ò
                                                     ò
```

```
DEVVLNG-----DEVINKG-----FINV---EKNSTINGKVYLSSGYNFT----FTL 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INOTSDKVQINWHSFDIGQNKEVEFKQPSENSVAYNRVTGGNASQIQGKLTANGKVYLAN 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ||: || : || SDS------GISVALEDNIVRGIVQNEGSIKAGEITLSAKGRKEALDSLVMNNGV 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268 LEATKVSNRNGKVVLSADNVQLNNESNIKGEIVNFGTEVTSNEDK---KLKITJSKTGSKV 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQN-SGWNLD 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S-----KAVAGSSGKV------ISGNVS------PSKGKMD-ETVNINA 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNV---DGNARAGIAQAIATAGLVQAYLPGKS 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SFIQTEALSSLLANNGKVNLKGNDVNISGNINIDSFRGTDSLLKLTNQGHINIDHADINS 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -GNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRIT- 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14 VQRTVAVLIVNSDKEGAGEKEKVE--ENSDWAVYFNEKGVLTAREITLKAGDNLKI---K 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --TSVIKEKDGKLVTGKDKGE-NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGTN~~~~~GD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OWERA3: OWERA9: OFFICE Content of the content of th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SDNVDFVRTYDTVEFLSADTKTTTVN--VESKDNGKKTEVKIGAK-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                6 AA APPROXIMATE TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93; Mismatches 223; Indels 124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1; Length 917;
                                                                                                                                                    REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7FF39BB8C046539D CRC64;
   5 AA TANDEM REPEATS
                                                                                                                                                    APPROXIMATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No. 0.067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT; 1655 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 177;
                                                                                                                                                        ¥
                                                                                                                                                    9
   489 MMAIGGGTYRGEAGYAIG 506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       100148 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NFYIDGGVSRNNSRYEYG 557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
24
24
29
34
111
111
203
277
277
839
6624
663
159
1159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OMPB_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                    REPEAT
REPEAT
DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
DOMAIN
REPEAT
                                                                                                                                                                                                                                                       REPEAT
REPEAT
                                                                                                                                                                                                                         REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OMPB_RICCN
   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEE DE DE LE COMMENTA LE COMME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
```

```
the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | R | Incerecology | Incerecology | R | Incerecology | Incerecology | R | Incerecology | Incercology | Incerecology | Incercology | Incerecology | Incerecology | Incerecology | Incerecol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Stenos J., Walker D.;
Stenos J., Walker D.;
The rickettsial outer membrane protein A and B genes of Rickettsia
australis, the most divergent rickettsia of the spotted fever group.";
Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
-:- FUNCTION: THE 120 KDA SUBFACE-EXPOSED PROTEIN IS A MAJOR
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -!- FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (BY SIMILARITY).
SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Phylogenetic analysis of members of the genus Rickettsia using the gene coding the outer-membrane protein rOmpB (ompB)."; Int. J. Syst. Evol. Microbiol, 50:1449-1455(2000).
                                                                                                                                                                                                                                                                                                       in Rickettsia conorii and R. prowazekii.";
                                                                                                                                                                                                                     Barbe V.,
                                                                                                                                                                                                                  Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E., Barbe
Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M.,
                    Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-Indian tick typhus, and Malish 7; MEDLINE-20393643; PubMed-10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                SEQUENCE FROM N.A.
STRAIN-Malish 7;
MEDLINE-21442074; PubMed=11557893;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AE108659; AAL03623:1; -. EMBL; AF123721; AAF34124.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; AF123726; AAF34129.1; -. EMBL; AF149110; AAD39533.1; -. PIR; E97835; E97835.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           [3]
SEQUENCE OF 353-1655 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 33-1649 FROM N.A.
                                                                                                                                                                                                                                                                                                                                     Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                          evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Roux V., Raoult D.;
Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SIMILARITY)
                                                                                                                                                                                                                                                                                                       "Mechanisms of
                                                                                 NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-Malish
                                                                                                                                                                                                                                                                          Raoult
```

```
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                            323
                                                                                                                                                                                                                                                                                                                                     -AAALQGITLANDATKTLTLGGANIIGANGGTINFQANGGTIKLTS--TQNNIVVDFDLA 589
                                                                                                                                                                                                                                                                                                                                                                                                                         422
                                                                  TNFTYSLKKDL-TDLTSVGTEKLSFSAHGNKVNI----TSDTKGLNFAK----ETAGTNG 122
                                                                                                                       DTT----VHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKD----VLNAGWNIK 175
                                                                                                                                                                           176 GVKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG-----KKTEV 221
                                                                                                                                                                                                                                                                222 KIGAKTSVIKEKDGKLVTGKDKG-----ENGSSTDEGEGLVTAKEVIDAVNKAGWRM 273
                                                                                                                                                                                                                                                                                                                                                                       ----NVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-DETVNIN---A 373
                                                                                                                                                                                                                                                                                                                                                                                               590 IATDQTGVVDASSLTNAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGDVAINELVI 649
                                                                                                                                                                                                                                                                                                                                                                                                                                                  650 GNNGAVQFAHNTYLITRTTNAAGQCKIIFNPVVNNNTTLATGTNLGSATNPLAEINFGSK 709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDG-NARAGIAQAIATAGLVQ 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     710 GAANVDTVLNVGKGVNL-YATNITTTDA---NVGSFIFNAGGTNIVSG-----TVGGQQ 759
                                                   14 VQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLK--IKQNG
                                                                                                                                                                                                                                                                                          480 RLGNAGSVFKLADGTVINGKVNQTALVGGALAAGTITLDGSATITG----DIGNAGG---
                                                                                                                                                                                                                                                                                                                  274 KTTTANGQIGQADKFETVT----SGINVTFASGKGTTATVSKDDQGNITVMYDV-
                                                                                                                                                                                                                                                                                                                                                                                                                         GNN--IEITRNGKNIDIATSMTPQ----FSSV----SLGAGADAPTLSVDGDALNVGSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-KI2 / MG1655;
MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YPJA OR B2647.
Escherichia coli.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            760 GNKFNTVALDNGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADFVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----AYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRG
                            Indels 116;
  DB 1; Length 1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-K12;
MEDLINE-97349980; PubMed-9205837;
Yamamoto Y., Aiba H., Baba T., Hayashi K., Inada T., Isono
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
6.4%; Score 177; DB 1; L 23.9%; Pred. No. 0.13; ative 71; Mismatches 265;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YPJA_ECOLI STANDARD; PRT; 1569 AA. P52143; P76610; P77017; P77019; 01-0CT-1996 (Rel. 34, Created) NI-0VT-1997 (Rel. 35, Last sequence update) 16-0CT-2001 (Rel. 40, Last annotation update) Hypothetical_outer membrane protein ypja.
                         71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enterobacteriaceae; Escherichia
NCBI_TaxID=562;
                         Conservative
             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                           142;
  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YPJA_ECOLI
                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                              g
                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                       염
                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                      ò
                                                                                                                                                        ò
                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                           원
                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                     ð
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        419 VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTQNINNYGIATGTNINSGTQNIK ----SGGKADTTIISSGSRQVVEKDGTAIGSNISA 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --DTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKG---VKPGTTASDNVDFVR 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSLIVYTGGIAHGVN-----QETGSALVANT-GAGTDIEGYNKLSHFTITGGEANYVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : | : | : | : | : | : 585 QSGALIASTTSGTLIEGTNSYGDAFYIRNSEAKNYVLENAGSLTVVTGSRAVDTIINAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTATVSKD-----DQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               T-----EKTHINGGTQ-TVQNYGKAIN--TDIVSGLQQIMANGTAEGSIINGGSQVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29 GAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     373 GSANKTIIKDKGTMSVLTNAKADAT----RIDNGGVMDVAGNATN-----TIING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---IGSTLT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            192 TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EGEGLV - - - - TAKEVIDAVNKAG - - WRMKTTTANGQTGQADKFETVTSGTNV - - TFASGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALN
                                                                                                                               Yamagata S., Horiuchi T.; "Construction of a contiguous 874 kb sequence of the Escherichia coli-K12 genome corresponding to 50.0-68.8 min on the linkage map and analysis of its sequence features."; DNA Res. 4:91-113(1997).
Itoh T., Kimura S., Kitagawa M., Makino K., Miki T., Mitsuhashi N., Mizobuchi K., Mori H., Nakade S., Nakamura Y., Nashinoto H., Oshima T., Oyama S., Saito N., Sampei G., Satoh Y., Sivasundarm S., Tagami H., Takahashi H., Takeda J., Takemoto K., Uehara K., Wada C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1569;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.4%; Score 176.5; DB 1; Length 9.6%; Pred. No. 0.13; ve 94; Mismatches 255; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TIGREAMS; TIGRO1414; autotrans_barl; 2.
Hypothetical protein; Outer membrane; Complete proteome.
SEQUENCE 1569 AA; 162774 MW; 0D006A9A32154596 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTEKLSFSAHGNKVNITSDTKGLNFAKETAGTNGDTTVHLNG----
                                                                                                                                                                                                                                                                                             -!- SUBCELLULAR LOCATION: Outer membrane (Potential).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AE000350; AAC75695.1. -
EMBL; D90889; BAA16514.1; ALT_INIT.
EMBL; D90890; BAA16518.1; ALT_INIT.
PIR; A65044; A65044.
EccGene; EG1313; ypjA.
InterPro; IPR006315; Autotransport.
InterPro; IPR00546; Autotransport.
InterPro; IPR005899; Pertactin.
InterPro; IPR003991; Pertactin.
Pfam; PF03797; Autotransporter; IPF03797; Pertactin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; U36840; AAA79815.1; ALT_SEQ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRINTS; PR01484; PRTACTNFAMLY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 19.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Loca
Matches
```

--YGSTGTAGA

299 874 469

```
1011 TAGADSTLIAGYGSTQTAGSDSSLTAGYGSTQTARQGSDVTAGYGSTGTAGADSTLIAGY 1070
                                                                            G----YGSTQTSGS------DSSLTAGYGSTQTAREGSDVTAGYGSTGTAGADSTL
                                                                                                                                                                                                                                      SGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPT
                                                                                                                                                                                                                                                                                     919 DSTLIAGYGSTQTSGSDSSLTAGYGST-QTARKG----SDMTAGYGSTGT-AGADSTL
                                                                                                                                                                                                                                                                                                                                                                                               971 IAGYGSTQTSGSD-----SSLTAGY------GSTQTAREGSDVTAGYGSTG
                             GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                               300 ASGKGTTATVSKDDQGNITVMY------DVNVGDALNVNQLQNSGWNLDSKAVAGS
                                                                                                                                                                                                                                                                                                                                           410 LSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                470 IAQA----IATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI--GYSSISDGG--NWIIKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=168 / BGSC1A1;
MEDLINE=95219088; PubMed=7704263;.
Yoshida K.-I., Sano H., Seki S., Oda M., Fujimura M., Fujita Y.;
"Cloning and sequencing of a 29 kb region of the Bacillus subtilis genome containing the hut and wapA loci.";
Microbiology 141:337-343(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=97124196; Pubmed-8969509;
Yoshida K.-I., Shindo K., Sano H., Seki S., Fujimura M., Yanai N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G.,
Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Molecular analysis of three major wall-associated proteins of Bacillus subtilis 168: evidence for processing of the product of gene encoding a 258 kDa precursor two-domain ligand-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Firmicutes; Bacillales; Bacillaceae; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Miwa Y., Fujita Y.;
"Sequencing of a 65 kb region of the Bacillus subtilis containing the lic and cel loci, and creation of a 177 containing the qut-sacXY region.";
                                                                                                                                                                                875 ISGYGSTQTAGSD--SSLTAGYGSTQTARKGSDVTAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2334 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Wall-associated protein precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=168;
MEDLINE=98044033; PubMed=9384377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=93302506; PubMed=8316082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Microbiology 142:3113-3123(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mol. Microbiol. 8:299-310(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1071 GSTQTAGS-DSSLTAGY 1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    522 ASGNSRGHFGASASVGY 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Rel. 30, (Rel. 30,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN-168 / BGSC1A1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacillus subtilis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [2]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=1423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WAPA OR N17G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28-FEB-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WAPA_BACSU
                                                                            829
                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 14
WAPA_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P
                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                            셤
                                                                                                                               Οy
                                                                                                                                                                                                                                    ά
                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SWISS-PROT entry is copyright. It is produced through a collaboration een the SWISS Institute of Bioinformatics and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       European Bioinformatics Institute. There are no restrictions on by non-profit institutions as long as its content is in no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           29 GAGEKEKVEENSDWAVYFNEKGVLTAREITLKAG------DNLKIKQNGTNFTYSLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              505 GYGSTQTAREGSDVTAGYGSTGTAGA-DSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  80 KDLT----DLTSVGTEKLSFSAHGNKVNITSD---TKGLNFAKETA-------G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      664 SDVTAGYGSTGTAGADSTLIAGYGSTQTSGSDSSLTAGYG-STQTARKGSDVTAGYGSTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120 TNGDFTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             723 TAGADSTLIAGYGSTQT----SGSDSSLTAGYGSTQTARKGSDV----TAGYGSTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180 GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 771 --TAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDITAGYGSTGTAGADSTLIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUBCELLULAR LOCATION: Outer membrane (By similarity).
DOMAIN: CONTAINS 153 IMPEREDT REPEATS OF THE CONSENSUS
OCTABEPTIDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESIDUE AND A
REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.
MISCELANEOUS: A STRUCTURAL MODEL IS SUGGESTED IN WHICH THE ICE
NUCLEATION PROPEIN DISPLAYS A SYMMETRY RELATED TO THAT OF ICE
SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Xanthomonas campestris pv translucens.";
Mol. Gen. 223:163-166(1990).
-!- FUNCTION: ICE NUCLEATION PROTEINS
CRYSTALLIZATION IN SUPERCOOLED WATER.
                                                                                                                                                                                                                                                                                                                                                                                            Gammaproteobacteria; Xanthomonadales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. 0.18;
69; Mismatches 246; Indels 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1567;
479 LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII--KGTASGNS
                                Zhao J., Orser C.S.;
"Conserved repetition in the ice nucleation gene inaX from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro: IPR000258; Ice_nucleatn.
Pfam; PF00818; Ice_nucleation; 81.
PRINTS; PR00327; ICENUCLEATN.
PROSITE: PS00314; ICE_NUCLEATION; 57.
Ice nucleation; Repeat; Outer membrane.
SEQUENCE 1567 AA; 152548 MW; C8B45ID959ECAD63 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1;
                                                                                                                                                                                                                              01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                                                                                                   PRT; 1567 AA.
                                                                                                                                                                                                                                                                                                                                                                      (anthomonas campestris (pv. translucens)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PubMed=2259339;
                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Gamm
Xanthomonadaceae; Xanthomonas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; X52970; CAA37140.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                fce nucleation protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=91080859;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=343;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-X56S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120;
                                                                                                                                                                                   CEN_XANCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FAMILY
                                                   815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Local
Matches 12
                                                                                                                                                                                                           P18127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the
                                                                                                                                                                                                           DATE TO DESCRIPTION OF THE PROPERTY OF THE PARTY OF THE P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
  ð
                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
```

ø

s.

genome kb contig

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
RA Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M., RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., Benizot F., Devine K.M., Dusterhoft A., Ebrilch S.D., Emmerson P.T., RA Entian K.D., Errington J., Fabret C., Ferrari E., Foulger D., RA Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Gradi G., Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A., Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L., RA Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M., Moris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Kein C., RA Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M., Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M., RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M., RA Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S., Schroeter R., Scoffone F., Sator T., Scanlan E., Schleich B., Rope M., Sadaie Y., Sakowska A., Seror S.J., Serror P., Shin B.S., Soldo B., Sorokin A., Tanaka T., Takahashi H., Takemaru K., Takahashi H., Takemaru K., Takahashi H., Takemaru K., Takahashi H., Takemaru K., Wainters P., Wipter B., Wedler E., Wedler H., Weltzenegger T., Whiters P., Wipter A., Vandenbol M., Vannier F., Vassanotti A., Wainters P., Wipter A., Vandenbol H., Vannier F., Vassanotti A., Wainters P., Wipter A., Vandence of the Gram-positive bacterium Bacillus R., Reper S., Sold 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 X 21 AA APPROXIMATE TANDEM REPEATS OF X(4)-G-X(4)-[YF]-X-D-X(2)-G-X(4).
2-1.
2-2.
2-3.
2-4.
2-5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FUNCTION: STILL UNKNOWN. NOT INVOLVED IN CELL MEMBRANE METABOLISM, MOTILITY, SECRETION OR DIFFERENTIATION.
SUBCELLULAR LOCATION: MEMBRANE-ASSOCIATED. MAY BE RELEASED INTO THE MEDIUM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN: HAS TWO LIGAND-BINDING DOMAINS; THE N-TERMINUS, HAS THREE 101 AA REPEATS WHICH ARE RESPONSIBLE FOR CELL WALL BINDING; THE C-TERMINUS CONSISTS OF TWO BLOCKS OF RESIDUES WITH A CONSERVED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Complete proteome.
OR 32 (POTENTIAL).
WALL-ASSOCIATED PROTEIN.
3 X 101 AA APPROXIMATE TANDEM REPEATS.
1-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Subtilist; BG10797; wapA.
InterPro; IPR003305; CBM_CenC.
InterPro; IPR006530; YD.
Pfam; PF02018; CBM_4—9; I.
TIGRFMA; TIGR01643; YD_repeat_2x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; L05634; AAA22883.1; -.
EMBL; D31856; BAA06556.1; -.
EMBL; D29985; BAA06280.1; -.
EMBL; D83026; BAA11683.1; -.
EMBL; S32920; S32920.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 390:249-256(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2334 869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     605
736
869
2139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1040
1061
1082
1102
1128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   504
636
769
1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1042
1063
1083
1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           <del>-</del>:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  +
```

```
23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1001 KTKDQTNA----YFNKKGGKLQKVVD---GHN-----NATVYTYNDKNQLTAITDASGRK 1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1049 LTFTYDENGHVTSITGPKNKKVTYSYE------NDLLKKVTDT---DGTVTSYD 1093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |: :| : :| : :| |- :| | | | |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |- :| |-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1142 ----ADKKTLLM---TQPNGRKVQYGYNEAGNPIQVIDDAEGLKITTUTKYEGNNVVEDV 1194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1232 KNNDVTKMKDTEGNVTDIAYD------GLDAVSETDQSGKSSSAAVYDK 1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93 LSFS--AHGNKVNITS-DTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVT 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        150 NDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA------SDNVDFVRTYDTV 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    248 SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTS----GTNVTFASG 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     303 KGTTATVSKDDQGNIT-VMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362 KG-KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421 SKKDNKPVRITNVAPGVKEG--DVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIA 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             33 KEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         197 EFLSADTKTTTVNVESKDNGKKTEV---KIGAKTSVIKEKDGKLVT-----GKDKGENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63; Mismatches 169; Indels 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1; Length 2334;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B75138CCD278BAA3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (APPROXIMATE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-JUN-1994 (Rel. 29, Created)
01-JUN-1994 (Rel. 29, Last sequence update)
01-OCT-1994 (Rel. 30, Last annotation update)
S-layer protein (Surface array protein) (SAP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6.3%; Score 173.5; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    933 AA
2-31.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2120 2139 2-3
2334 AA; 258329 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local Similarity 23.1
Matches 110; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                             11665
11709
11709
11730
11731
11772
11814
11818
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
11982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1983
2008
2028
2028
2051
2071
                                                                                                                                                                                                                                                                                                                                                                                                                                     861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   696
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLAP_CAMFE
P35827;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                  REPEAT
                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 15
SLAP_CAMFE
                                                                                                  REPEAT
                                                                                                                                       REPEAT
                                                                                                                                                                   REPEAT
                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GEDALAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏλ
```

Page 13

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 : 1:1 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    294 YEKVGFNVLGDIVSFATDASKSVNV--ETTGTITAFTAAGTGKVDVVAGKISALTADSRT 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TVHLNGIGSTLTDTLLNTGATTNVTNDNVTD-----DEKKRAA----- 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        :|:| | : | | | : |: | | svnltatndtitlsanaatsvnlkqrqakdatitsamqqkynnrrniatitsataven 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TEGSVIDAPGNDTIAMKSAALTSANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTK 638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---NGDT 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----KKTEVKIGAKTSVIKEK-----DGKLVTGKDKGENGSSTDEGEG-- 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  525 LVIKGAEVETLVN----IDTTAFNALQSVSFGKTGQGGKF-SVKTGTGDDKIEFVGTTL 578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVSK--DDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSK 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EAADTTLTINKDQVINFTAADAGSVKLITVKLNDVTALMIVVKIVLDAAAKDTNIALGTA 698
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412 LTVKHATNVALNGGMDKLATVTLDNAALTAAIDI-----KSASTLNLINSSVNGPKHL 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              465 YSSKRRYCKFKRAAAKVKLNTTAATDQTVTLKANATDNSLEFDSATAKTTSVTASGSGKT 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -LVTAKEVIDAVNKAGWRMKTITAN-----GQTGQADKFETVTSGTNVTFASGKGTTA 307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363 GKMDETVNINAGNNIEITRNGKN-------IDIATSMTPQFSSVSLGAG 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                405 ADAPILSVDG--DALNVGS-KKDNKPVRITNVAPGVKEGDVTNV----AQL----KGVAQ 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           38 ENSDWAVYFNE--KGVLTA--REITLKAGDNLKIKQNGTNF-TYSLKKDLT---DLTSVG 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -SVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTVN-VESKDNG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Blaser M.J., Gotschlich E.C.;
J. Balol. Chem. 265:19372-19372(1990).

-1- FUNCTION: THE S.LAYER IS A PARACRYSTALLINE MONO-LAYERED ASSEMBLY
OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS
CRITICAL FOR VIRULENCE.
-1- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
Campylobacter fetus.
Bacteria; Proteobacteria; Epsilonproteobacteria; Campylobacterales;
Campylobacteraceae; Campylobacter.
                                                                                                                                                                                        SEQUENCE FROM N.A., AND SEQUENCE OF 1-20.
STRAIN=84-32 / 23D;
MEDLINE-90354448; PubMed-2387868;
Blaser M.J., Gotschilch E.C.;
"Surface array protein of Campylobacter fetus. Cloning and gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Match 6.3%; Score 173; DB 1; Length 933; Local Similarity 22.4%; Pred. No. 0.11; les 138; Conservative 72; Mismatches 243; Indels 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; J05577; AAA23032.1; -.
Cell wall; S-layer.
SEQUENCE 933 AA; 96757 MW; F88C729B4BA5B1E9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TEKLSFSAHGNKVNITSD-TKGLNFAKETAGT-
                                                                                                                                                                                                                                                                                                                                                                                                                             Biol. Chem. 265:14529-14535(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-91035477; PubMed-2229082;
                                                                                                                                                                                                                                                                                                                                                                                                 structure.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   308
    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

-:: ::

THIS PAGE BLANK (USPTO)

neisseria

7

```
09f3x finesterial 09f3x visite fas 09f3x visita fas 08kqm8 moraxella c 08kqm9 moraxella c 08f2d8 salmonella 09fc04 xylella fas 08fcb2 escherichia 09f3x5 pasteurella 08xd94 escherichia 08xd94 escherichia 08xd94 escherichia 08xd94 escherichia 08xd94 acctinobacil
                             09jps9 neisseria m
09jpr7 neisseria m
09jpr7 neisseria m
09jpb0 neisseria m
09jpi0 neisseria m
09jqu4 neisseria m
08jqu4 haemophilus
08gm74 haemophilus
08gm75 haemophilus
08gm76 haemophilus
08gm77 haemophilus
08gm77 haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=BZ147.

X MEDLINE=20175756; PubMed=10710308;
A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Hood D.W., Jeffries A.C., Sannders N.J., Granoff D.M., Venter C.,
T "Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R EMBL, AF226366; AAF42215.1; -
R InterPro: IPR038954; YadA.
R Pfam; PF03895; YadA.
SEQUENCE 591 AA, 62113 MW; 533453CAE5A9IEIF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-COT-COTORD (TrEMBLRel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ouery Match 98.9%; Score 2727; DB 2; Best Local Similarity 99.3%; Pred. No. 1.2e-107; Matches 536; Conservative 1; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                           Q8ZL64
Q9F2D8
Q9FC04
Q8FCB2
Q9F3X5
Q8XDG4
Q8RQ60
                                                                                                                                                                                                                                                                                               Q9F3X6
Q9PD50
Q8KQM8
                                                                                                                               0930Y1
09J0W4
P71401
08GM74
048152
08GM75
08GM76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
Q9JPR8
Q9JPS8
Q9JPS9
Q9JPR7
                                                             0930Y2
09JPH0
09JPS5
                                                                                                               09JPI0
                                                                                                                                                                                                                                                                                                                                                 OBKOM9
                                                                                                                                                  91
                                                                                                                                                                                                                                                                                                 16
                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=487;
                                              2328
                                                                               2284.5
2284.5
2252.5
2241.5
2212
1031.5
908
                                                                                                                                                                                                                               904.5
904
                                                                                                                                                                                                                                                                591
588.5
                                                                                                                                                                                                                                                                                                                                 385
371.5
369.5
365.5
361.5
364
361.5
345
                                                                                                                                                                                                                                                                                                 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9JPS7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 1
 1D DTT ACCOON NAME OF THE OF T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3 neisseria n
neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EEEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9jps7 neisseria m
                                                                                                                                 (without alignments)
3513.485 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  093qy3 neisseria
09aqf0 neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                               October 6, 2003, 09:13:10 ; Search time 39.661 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Description
                                                                                                                                                                            US-09-771-382-33
2757
1 NNEEQEEYLYLHPVQRTVAV.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   09jr18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   093qy4
09jps6
09jpi3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 09jps2
09jph7
09jpr9
09jps0
09jps0
09jpt0
09jps4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   09jps3
                                                                                                                                                                                                                                                                                                                                 830525
            GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                            Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                               830525 seqs, 258052604 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                 summaries
                                                                               - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS7
Q9JR18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0930Y3
0940F0
0930Y4
0930Y4
0940P3
0940P3
0940P8
0940P8
0940P8
0940P8
0940P8
0940P8
                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sp_fung1:*
sp_human:*
sp_invertebrate:*
sp_mammal:*
sp_mhc:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_unclassified:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_vertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp_organelle:*
sp_phage:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_archea:*
sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                             Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sp_plant: *
sp_rodent: *
sp_virus: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sp_archeap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
Match Length DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SPTREMBL_23:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              998.99
998.99
998.99
998.99
990.7.22
990.74
990.94
889.99
889.99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2727
2628.5
2628.5
2628.5
2628.5
2511
2511
2511
2501
2501
2501
2501
2708
2403
2478
2478
2478
2478
                                                                                                                                                                                                Perfect score:
                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                               OM protein
                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                  Sednence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                               Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                44
6 0
110
113
113
113
114
115
```

ö

Gaps

;

a

```
Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ă
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DA LA LA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                231
                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                       351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          591
                                                                                                   TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                            KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA
                                                                                                                                                                                                                                                                                                                                                                    SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                      SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRIN=MC58 / Serogroup B, B2169, B283, and H44/76;
STRAIN=MC58 / Serogroup B, B2169, B283, and H44/76;
STRAIN=MC58 / Serogroup B, B2169, B283, and H44/76;
MEDLINE=20175756; PubMed=10710308;
A Redinson Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Ratti G., Santini L., Savino S., Scarselli M., Stoni E., Zuo P.,
A Ratti G., Santini E., Mappe B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.;
I'dentification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-MCSB / Serogroup B;
MEDLINB-20175755; PubMed-10710307;
MEDLINB-20175755; PubMed-10710307;
Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson K.E., Bisen J.A., Ketchum K.A., Heodo D.W., Peden J.F., Dodson R.J., Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K., Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B.A., Mason T., Clecko A., Parksey D.S., Blair E., Cittone H., Clark E.B., Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein).

GNA992 OR NMB0992 OR NHHA.

GNA992 OR NMB0992 OR SUPPLIATION OF SUPPLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-2002 (TrEMBLrel. 29, Last annotation update)
01-OCT-2002 (TrEMBLrel. 20, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM
STRAIN=MC58 /
                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                        352
                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              412
                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JR18
Q9JR18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09JR18
                                                      g
                                                                                                                                         g
                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                    strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTANGQTGQADKFETVTSGTNVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKKDNKPVRITHVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                            Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel on membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AR226375; AAR42524.1;
EMBL; AR226375; AAR4251.1;
EMBL; AR226377; AAR42519.1;
EMBL; AR226374; AAR42519.1;
EMBL; AR226374; AAR42533.1;
EMBL; AR226374; AAR48872.1;
Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L.,
Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.;
 "Complete genome sequence of Neisseria meningitidis serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                             591 AA; 62112 MW; 7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2727; DB·16;
Pred. No. 1.2e-107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1; Mismatches
                                                                                                                           SPECIES=N.meningitidis; STRAIN=PMC21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                              98.98;
99.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, 01-OCT-2002 (TrEMBLrel. 22, NhhA outer membrane protein.
                                                                       Science 287:1809-1815(2000)
                                                                                                                                                                                                                                                                                                                                               InterPro; IPR005594; YadA. Pfam; PF03895; YadA; 1. Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 536; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                      NMB0992;
                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0930Y3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q93QY3
                                                                                                                                                                                                                                                                                                                                      TIGR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
Q93QY3
```

ద

ŏ g δ 셤 δ

ò

```
GSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL 479
                                                                                                                                                                                                                                                                                                                                                                                412 PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPILSVDGDALNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480 VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60 KAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120 TNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 NNEE-QEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300 ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360 PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNV
                       Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.; "Identification and characterisation of a gene encoding a novel outer membrane protein of Neisseria meningitidis."; Submitted (FEB-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=NGE28;
MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico'
                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                              62290 MW; 168986A97381EFC5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
                                                                                                                                                                                                                                                Score 2695.5; DB 2;
Pred. No. 2.5e-106;
4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               590 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                  4;
                                                                                                                                                                                                                                                97.8%;
98.2%;
                                                                                                                     EMBL; AF125375; AAK09243.1;
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 592 AA; 62290 MK
                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 531; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540 W 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    W 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RT RT DR DR DR DR SQ SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTNVTFA 300 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 | 1111 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVG 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLV 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481 QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09
                                                                                                                                                            STRIN=EG329;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157606; AAK68867.1;
Interpro; IPR005594; YadA.
Interpro; IPR005594; YadA.
SEQUENCE 591 AA; 62048 MW; CODC600798859C65 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                  Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2720; DB 2;
Pred. No. 2.3e-107;
1; Mismatches 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                       98.7%;
99.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9AQF0;
01-JUN-2001 (TrEMBLrel. 17,
01-JUN-2001 (TrEMBLrel. 17,
01-OCT-2002 (TrEMBLrel. 22,
                                                                                                                                                                                                                                                                                                                                                                                                                                               al Similarity 99.1
535; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Outer membrane protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                        NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9AQF0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
Q9AQF0
```

g οy g g ŏ 셤

Qγ

g

ò g

ò

299

351

239 231

291

111

59

Gaps

1;

171

359

411

419

471

531

591

Э В

ë,

Gaps

65

```
KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6 EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL
                                                                                                                                                                                                                                          INGDITVHLNGIGSTLIDTLLNTGATINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                          GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                         GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                           ASGRGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                           PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
                                                                                                                 8;
                                                                                       594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Betaproteobacteria; Neisseriales;
                                                                                                                 Indels
                                                                                         Length
   membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, ARIS7605, AAK68866.1; -.
InterPro; IPR005594; YadA.
                                                                9DDD48B04B3A8EA2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
00-0uter membrane protein GNA992.
                                                                                       91.1%; Score 2512; DB 2;
                                                                                                  1.3e-98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ā
                                                                                                                13; Mismatches
                                                                                                      Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                               62297 MW;
                                                                                                      92.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                    al Similarity 92.4
501; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                  Pfam; PF03895; YadA;
                                                                594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ~ š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          š
                                                                                                                                                                                         99
                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                 233
                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                  353
                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 593
                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         539
                                                                                         Query Match
                                                                                                      Best Local
Matches 5(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
     RT
RL
DR
DR
SO
                                                                                                                                                                q
                                                                                                                                                                                       ò
                                                                                                                                                                                                                g
                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                     350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                             GDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAGTN 121
                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         291 GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                           GDTIVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGT
                                                                                                                                                                                                                                                                                                                                                                            TASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK
                                                                                                                                                                                                                                                                                                                                                                                                                            DKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 Y., Dieckelman M., Moxon R., Jennings M.P.; characterization of a gene encoding a novel outer
          Ś
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Marchification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).

EMBL, AF226378; AAF42372.1; -.
                                                                                                                                                                                                    3;
                                                                                                                                                                            DB 2; Length 590;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                    Indels
                                                                                                                                                    8AA476AC300D80C8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TrEMBLrel. 19, Created)
(TrEMBLrel. 19, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                         Score 2624.5; DB 2;
Pred. No. 2.4e-103;
4; Mismatches 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594
                                                                                                                                     Pfam; PF03895; Yada; 1.
SEQUENCE 590 AA; 61661 MW;
                                                                                                                                                                          95.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NhhA outer membrane protein
                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=EG327;
Peak I.R., Srikhanta
"Identification and c
                                                                                                                                                                                      Local Similarity
nes 522; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-DEC-2001 (
01-DEC-2001 (
01-OCT-2002 (
                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                     231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  471
                                                                                                                                                                                                                                                   23
                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    531
                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q93QY4
Q93QY4;
                                                                                                                                                                                         Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0930Y4
  g
                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                           ð
                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
```

, v

S

ά,

```
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Galecti C.L., Savino S., Scarselli M., Storni E., Zuo P.,
Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoll R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
E Science 287:1816-1820(2000).
R EMBL; AF226359; AAF42518.1;
FREMBL; AF226359; AAF42518.1;
FREMBL; AF226359; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Outer membrane protein GNA992
                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                  al Similarity
499; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ||
593 QW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MO
                                                                                                                                                                                                                                                                                         99
                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                            293
                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          539
                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS2
Q9JPS2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNA992.
                                                                                                                                                                                                         Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 9
      RA
RA
RA
RT
RT
DR
DR
SO
SO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δý
                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                          3;
                                                                                                                                                                                                                                                                          GKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSG 294
                                                                                                                                                                                            AGDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFA 114
                                                                                                                                                                                                                                                                                                                           KGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD 234
                                                                                                                                                                                                                                                                                                                                        INVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVI 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA 534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLK 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                        10;
  Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H Hood D.W., Joffries A.C., Saunders N.J., Granoff D.M., Venter-Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                   Length 600;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                / Match 91.1%; Score 2511; DB 2; Length 6. Local Similarity 91.6%; Pred. No. 1.5e-98; nes 500; Conservative 12; Mismatches 24; Indels
                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-membrane protein GNA992.
                                             Meningcoccus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226311; AAF42520.1; -.
InterPro; IRR005594; Yada.
Pfam; PF03895; Yada, 1.
SEQUENCE 600 AA; .62762 MW; 36256963E0598CD1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
STRAIN-NG3/88, and B2232;
MEDLINE-20175756; Pubmed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992.
Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SVGYQW 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=487
                                                                                                                                                                                                                                                    115
                                                                                                                                                                                                                                                                                                                                                                                                                                              355
                                                                                                                                                                                                                                                                           115
                                                                                                                                                                                                                                                                                                                                                                          235
                                                                                                                                                                                                                                                                                                                                                                                                295
                                                                                                                                                                                                                                                                                                                                                                                                                       295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9JPI3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JPI3
                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 8
                                                                                                                                   Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOR BREEFER BRANCOS
                                                                                                                                                                                                     g
                                                                                                                                                                                ò
                                                                                                                                                                                                                              ð
                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
```

```
119
                                                                                                                                                                                           172
                                                                                                                                                                                                                          179
                                                                                                                                                                                                                                                     232
                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                           418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 532
                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                        352
                                                                                                                                                                                                                                                                                                                                                                                                   359
                                                                                                                                                                                                                                                                                                                                                                                                                              412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                                                                                                                                                                                                              292
                                                                                                       65
                                                                                                                                                                                                                          KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                             113 KIKONTDENTNASSFTYSLKKDLTDLTSVETEKLSFGANGKKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                  GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                 300 ASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                    6 EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL
                                                                                                                                                                                                                                                                                                                                            240 GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     419 VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                            Gaps
                                                                                                                                                                               8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                          Indels
                                             Length
Pfam, PF03895; Yada; 1.
SEQUENCE 594 AA; 62086 MW; 1B25E03B90D04B46 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                          90.7%; Score 2501; DB 2; 92.1%; Pred. No. 3.9e-98; ive 12; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
```

```
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.; "Identification and characterization of a gene encoding a novel outer membrane protein of Netsseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases. EMBL, AF226568, AAF42517.1; -...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GDNLKIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASA
                                                                                                                   Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Calactti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Sauntini L., Savino S., Scarselli M., Storni E., Zoo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.K., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 594;
                            Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                       62361 MW; 436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2493; DB 2;
Pred. No. 8.5e-98;
9; Mismatches 29;
                            Betaproteobacteria;
                                                                           SEQUENCE FROM N.A.
STRAIN-BZ198, and 297-0;
MEDLINE-20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                EMBL; AF157604; AAK68865.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                               sch 90.4%; 11 Similarity 91.6%; 500; Conservative
                                                                                                                                                                                                                                                                                                                                                                                           InterPro; IPR005594; YadA.
GNA992 OR NHHA.
Neisseria meningitidis.
Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF03895; YadA;
SEQUENCE 594 AA;
                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                   NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                    STRAIN-BZ198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   529
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        475
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Loc
Matches
 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              472
                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                       172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         478
                                                                                                                                                                                                                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         592
                                                                                                                                                                                                                                                                                                                            65
                                                                                                                                                                                                                                                                                                                                                                                                                                                KIKQ-----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGLNFAKETAG
                                                                                                                                                                                                                                                                                                                                                                                              120 INGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               233 GTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ASGRGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTTASDNVDFVRTYDTVEFLSADFKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGOTGOADKFETVTSGTNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Comaducci M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comaducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nutti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffites A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Scroproup B Science 287:1816-1820(2000).

EMBL, AF226379; AAF42581; -.
                                                                                                                                                                                                                                                                                                 æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992 (NhhA outer membrane protein).
                                                                                                                                                                                                                                                                     Length 594;
                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                          594 AA; 62114 MW; 1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                                                                                   90.7%; Score 2501; DB 2; 92.1%; Pred. No. 3.9e-98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Æ
                                                                                                                                                                                                                                                                                   Pred. No. 3.9e; Mismatches
                                                 MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                12;
                                                                                                                                                                                                                                                                                                Matches 499; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                                                                                                                                                                                           Pfam; PF03895; YadA;
                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | |
QW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      533
                                                                                                                                                                                                                                                                                                                          ڡ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                             99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           479
                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          593
                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            09ЛРН7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       09JPH7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              84448B
ò
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
```

Gaps

8;

61

168

348 355 415

474

à 용

```
471 AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Nelsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226381; AAF42530.1;
EMBL; AF157607; AAK68868.1;
InterPro: IRR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Indentification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12;
                                                                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992 (NhhA outer membrane protein).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 598;
                                                                                                                                                                                                                                                                                               Bacteria; Proteóbacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    598 AA; 62763 MW; E6C7AEF0BB8A63CB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               89.9%; Score 2478; DB 2; 90.4%; Pred. No. 3.7e-97; ive 10; Mismatches 31;
                                                                                                                                                                          598
                                                                                                                                                                                                                                                                                                                                                                               STRAIN-NGH15;
MEDLINE-20175756; PubMed-10710308;
                                                                                                                                                                                                      01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2002 (TrEMBLrel. 22,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                            PRELIMINARY;
                                                             540
                                                                                                                                                                                                                                                                                      Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; YadA;
                                                                               GASASVGYQW
                                                              GASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   al Similarity
497; Conserv
                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pfam; PF03895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-H15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                             531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                         09JPS0
                                                                                                                                                                          09JPS0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Loca
Matches
                                                                                                                                                         09JPS0
                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                             g
                                                              ò
                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WIIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                              Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Granoff G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Geome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         90.4%; Score 2491; DB 2; Length 598; 90.9%; Pred. No. 1e-97; ive 9; Mismatches 29; Indels 17
                                                                                                                                                                                                                                       Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62718 MW; 9095F8E31AD7C76D CRC64;
                                                                                                                01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-ter membrane protein GNA992.
                                                                                                           598
                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                   STRAIN=NGH36;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; AF226382; AAF42531.1; -.
InterPro; IPR005594; YadA.
Pfam: PF03895; YadA; 1.
SEQUENCE 598 AA; 62718 MW;
                                                                                                                                                                                                                     Neisseria meningitidis.
Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                           PRELIMINARY;
 SVGYOW 540
                  |||||||
|SVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                     NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          500;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                           Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Loc
Matches
                                                                            RESULT 11
                                                                                              Q9JPR9
```

ద

a

ò

g

ò g ò

ò

g

g οŽ g

ò

ë.

108 111

61

168

228 231 288

171

348

ŏ g qq å g ò

ð

g

g

δ

```
108
                                            468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                  EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                             409 KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                         412 VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                          2 NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDNLKIKQ -----NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109 GDNLKIKQNTNENTNENTNESSFTYSLKKDLFDLTSVETEKLSFGANGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pizza M. Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Sautini L., Savino S., Scarselli M., Storni E., Zoo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).

EMBL; AF226359; AAR42508.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     598;
                                                                                                                                                                                                                                                                                                                                                                                       GNA992.
Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62763 MW; 63A6A3BD7F0F2EE3 CRC64;
                                                                                                                                                                                                                                                                                                                              01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  89.9%; Score 2478; DB 2; 90.2%; Pred. No. 3.7e-97; ive 11; Mismatches 31;
                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=2996;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity 90.2
nes 496; Conservative
                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                589 GTSASVGYQW 598
                                                                                                                                                                                                GASASVGYOW 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF03895; Yada;
SEQUENCE 598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    232
                  352
                                                                                                                                                                                                531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                     OBJETO;
                                                                                                                                                                                                                                                                                                      09JPT0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Loca
Matches
                                                                                                                                                                                                                                                                          RESULT 14
                                                                                                                                                                                                                                                                                        Q9JPT0
                                                                                                     Q
                                                                                                                                                                   g
                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dβ
                                            QQ
                                                                           δy
                                                                                                                                    δ
                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                       468
                                                                                                                        470
                                                                                                                                                                                 530
                                                                                                                                                                                                            588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    351
   351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                              GDNLKIKQ------NGTNFTYSLKKDLTDLTSVGTEKLSFSAHGNKVNITSDTKGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG
                                                                                                                        VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                                                                                   VDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NEEQEEYLYLHPVQRTVAVLIVNSDKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M.P.;
novel c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Moxon R., Jennings
a gene encoding a n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-BZ10;
STRAIN-BZ10;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennin Feak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennin Identification and characterization of a gene encoding membrane protein of Nelsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases. EMBL; AFIS7603; AAK68864.1;
InterPro; IRR005594; YadA.
Pfam: PF03895; YadA.
SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CRC64;
                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel. 19, Created)
(TrEMBLrel. 19, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        89.9%; Score 2478; DB 2; 90.2%; Pred. No. 3.7e-97; iive 11; Mismatches 31
                                                                                                                                                                                                                                                                                                                                                 Æ
                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                        NhhA outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best_Local Similarity 90.2
Matches 496; Conservative
                                                                                                                                                                                                                                          GASASVGYQW 540
                                                                                                                                                                                                                                                           Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                            Q93QY5;
01-DEC-2001 (
01-DEC-2001 (
                                                                                                                                                                                                                                                                                                                                                                                                       01-OCT-2002
                                                                                                                                                   69
                                                                                                                                                                                                            529
                                                                                                                                                                                                                                          531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  292
                                349
                                                                                       409
                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349
   292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                               093QY5
                                                                                                                                                                                                                                                                                                                    RESULT 13
                                                                                                                                                                                                                                                                                                                                093QY5
```

g

ò g δ 셤 δŏ

õ

g

ò g ò 셤

ä

```
Search completed: October
Job time: 41.661 secs
                                                                                                                                                                                    376
                                                                                                                                                                                                                                                                                                                                                                      496
    256
                                                                                                                                                                                                                                                                              436
                                        В
                                                                                            ò
                                                                                                                                g
                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                    Ω
                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       411
                                                                                                                 VDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI 470
                                                                                                                                                                                                                                                                                                      75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                           KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                           AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DKEGAGEKEKVEENSDWAVYFNEKGVLTAREITLKAGDNLKIKQ-------NGTNFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Kaapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2; Length 526;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Outer membrane processive and proces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        88.6%; Score 2442.5; DB 2; Length
.92.0%; Pred. No. 9.9e-96;
Live 10; Mismatches 21; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             54732 MW; F543C4234AF807CA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             T-2000 (TrEMBLrel. 15, Last sequence update)
T-2002 (TrEMBLrel. 22, Last annotation update)
membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=NG6/88;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-2000 (TrEMBLrel, 15, 01-OCT-2000 (TrEMBLrel, 15, 01-OCT-2002 (TrEMBLrel, 22,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF226377; AAF42526.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity 92.0
483; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                   GASASVGYQW 540
                                                                                                                                                                                                                                                                                                                                                                                                PF03895; Yada;
NCE 526 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                             349
                                                                                       352
                                                                                                                                    409
                                                                                                                                                                                 412
                                                                                                                                                                                                                              469
                                                                                                                                                                                                                                                                         471
                                                                                                                                                                                                                                                                                                                      529
                                                                                                                                                                                                                                                                                                                                                                   531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 15
Q9JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                  g
                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                          g
                                                                                       ò
                                                                                                                                                                                 ò
                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
```

6, 2003, 09:30:47

THIS PAGE BLANK (USPTO)

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein . protein search, using sw model

October 6, 2003, 09:13:35 ; Search time 15.4863 Seconds (without alignments) 3359.577 Million cell updates/sec Run on:

US-09-771-382-34
2735
1 TDEDEEEELESVQRSVVGSI.....TASGNSRGHFGASASVGYQW 541 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

283308 segs, 96168682 residues Searched:

283308 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR_76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	probable surface f	z		surface protein XF	probable adhesin Z	probable adhesin E	surface protein XF	probable autotrans	probable surface p	high-molecular-wei	surface-array prot	surface-exposed on	probable adhesin h	hypothetical prote	190K surface antig	probable autotrans	hypothetical prote	probable RTX famil	hypothetical prote	0	ABC-type transport	sapB protein - Cam	filamentous hemagg	hemolysin A precur	hypothetical prote	ಥ	outer membrane pro	hypothetical prote	
SUMMARIES	£1	A81888	G81133	164138	D82671	A86036	н91188	A82615	AC0976	AH0110	A43855	A56143	C82672	AF0394	T31105	A41477	AD0123	E97835	B85547	F90696	AH0038	C48399	140711	T31102	A35140	876109	B43855	JC1340	T33369	m
	th DB	!			2059 2																									
	Length									٠										25										
ď	Query Match	92	85	15	14.4	13	3	3	3	Н	8.4	•	•	7.8	7.8	•	7.6	7.6	7.5	7.4	7.3	7.2	7.2	7.2	7.2	7.2	7.1	7.1	7.1	7.1
	Score	2527	2330.5	435.5	392.5	377	377	368.5	363	321.5	231	225	220.5	214	212.5	210	207	206.5	204.5	203.5	200	198	σ	197.5	197	197	195	195	194	193.5
	Result No.	 	7	æ	4		9	7	œ	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

190-KDa cell surfa	hypothetical prote	surface array prot	hemagglutinin/hemo	hypothetical prote	cell surface prote	flagellin [importe	hypothetical prote	extracellular seri	S-layer protein -	probable autotrans	hemolysin [importe	hemagglutinin/hemo	hemagglutinin/hemo	hypothetical prote	hypothetical prote
A97859	F85809	140614	B99789	E85649	AB3486	F90961	AC2224	AB3528	T03415	AF0351	AI0452	B81192	G81044	D89824	A83412
7	7	~	7	7	7	7	7	7	~	~	7	7	7	7	7
2021	585	920	1268	1270	365	585	1428	2554	1361	1430	1635	1975	1995	1385	2468
6.9	6.9	6.9	6.9	6.9	6.9	6.8	8.9	9.9	6.8	9.9	6.8	6.7	6.7	6.7	6.7
189.5	189	189	188.5	188.5	187.5	187	187	187	186.5	185.5	185.5	184.5	184.5	184	184
30	31	32	33	34	35	36	37	38	33	40	41	42	43	44	45

ALIGNMENTS

	RESULT 1 A01888 probable surface fibril C;Species: Neisseria me C;Date: OS-May-2000 #se C;Accession: A01888 R;Parkhill, J; Achtwan Holroyd, S.; Jagels, Nature 404, 502-506, 20 A;Title: Complete DNA s A;Reference number: A01 A;Accession: A01808 A;Status: preliminary A;Neicelle type: DNA A;Neicelle type	RESULT 1 A81888 probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain Z C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Accession: A81888 C;Accession: A81888 R;Parkhill, J.; Achtuman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Mo Parkhill, J.; Achtuman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Mo Nature 404, 502-506, 2000 A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491 A;Reference number: A81775; MUID:20222556; PMID:10761919 A;Status: preliminary A;Status: preliminary A;Status: preliminary A;Recession: A81888
	A, Cross-referen A, Experimental C, Genetics: A, Gene: NMA1200	AL162755; GB:AL157959; NID:g737 serogroup A, strain 22491
	Query Match Best Local Similarity Matches 507; Conser	92.4%; Score 2527; DB 2; Length 592; Similarity 93.4%; Pred. No. 7e-121; 7; Conservative 9; Mismatches 23; Indels 4; Gaps 2;
•	Qy 1 Db 52	TDEDEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLK 60
	Qy 61 Db 112	IKQNTNENTNASSETYSLKKDLJGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT 120
	Qy 121 Db 172	NGDTTVHLNGIGSTLTDMLLNTGATINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
·	Qy 181 Db 230	TTASDNVDEVRTYDTVEELSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLV 238 : -
	Qy 239 Db 290	TGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTKVT 298
	Qy 299 Db 350	FASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGMNLDSKAVAGSSGKVISGNV 358
	Qy 359 Db 410	SPSKGKMDETVNINAGNNIEITRNGKNIDIATSWTPQFSSVSLGAGADAPTLSVDDEGAL 418

	C; Accession: 164138 R; Felstschmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage R; Felstschmann, R.D.; Ashtrley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Geoghagen, N.S.M. Science 269, 496-512, 1995 A; Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Vente A; Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A; Reference number: A64000; MUID:95350630; PMID:7542800 A; Residues: 1-298 < TIGR: A; Residues: 1-298 < TIGR: A; Coss-references: GB:U32846; GB:L42023; NID:g1574588; PID:g1574589; TIGR:HI1732 A; Coss-references: GB:U32846; GB:L42023; NID:g1574589; TIGR:HI1732 Best Local Similarity 48:0%; Pred: No. 2:6e-15; Adams 7; Indels 31; Gaps 7; Indels 31; Gaps 7; IIIII III III	0 0 0 0 0 0 0 0 0 0	RESULT 4 Bullotted by Surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c) C; Species: Xylella fastidiosa C; Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000 C; Accession: D82671 R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Seq R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Seq Nuture 406, 151-157, 200 A; Title: The genome sequence of the plant pathogen Xylella fastidiosa. A; Reference number: A82515; MUID:20365717; PMID:10910347 A; Note: for a complete list of authors see reference number A59328 below A; Accession: D83671 A; Residues: 1-2059 (SIMA) A; Reinach, F.C.; Arruda, P.; Rerreira, A.J.S. Submitted to GenBank, June 2000 A; Authors: Ferreira, A.M.B.; Reinach, H.M.F.; Marques, M.V.S.; Ranper, M.L.; Kanper, M.L.; Marques, M.V.S.; Reinach, M.V.S.; Rei
NVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATA 478	RESULT 2 GB1133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: GB1133 R;Tettellin, H; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eiser Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, I., H; Qin, H; Vamathevan, J; Gill, J; Scarlato, V; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000 A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoll, A;Authors: Complete genome sequence of Neisseria meningitidis serogroup B strain MC56 A;Reference number: A81000; MUID:20175755; PMID:10710307 A;Reference number: A81000; MUID:20175755; PMID:10710307 A;Residues: 1-591 <tety 1-591="" <<="" <tety="" a;residues:="" td=""><td>Ouery Match 85.2%; Score 2330.5; DB 2; Length 591; Best Local Similarity 86.8%; Pred. No. 6.3e-111; Matches 475; Conservative 22; Mismatches 35; Indels 15; Gaps 6 2 DBDEEEELESYQRSV-VGSIQASMEGSVELETISLSMINDSKEVDPYIVVTLK 54 : :: : : - - :: - - - - - 53 NEGQEEDLYLDPYQRTVAVLIVNDSKEGTGEKKVE-ENSDWAVFNEKGVLARETILK 111 55 AGDNLKIKQNINENTASSFTYSLKKDLTGLINVPTEKLSFGÄNGKKVNISDTKGLNFA 114 - - - - - - </td><td> </td></tety>	Ouery Match 85.2%; Score 2330.5; DB 2; Length 591; Best Local Similarity 86.8%; Pred. No. 6.3e-111; Matches 475; Conservative 22; Mismatches 35; Indels 15; Gaps 6 2 DBDEEEELESYQRSV-VGSIQASMEGSVELETISLSMINDSKEVDPYIVVTLK 54 : :: : : - - :: - - - - - 53 NEGQEEDLYLDPYQRTVAVLIVNDSKEGTGEKKVE-ENSDWAVFNEKGVLARETILK 111 55 AGDNLKIKQNINENTASSFTYSLKKDLTGLINVPTEKLSFGÄNGKKVNISDTKGLNFA 114 - - - - - -	

UWGP:

```
substrain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probable adhesin ECs4480 [similarity] - Escherichia coli (strain 0157:H7, substr. C; Species: Escherichia coli (c; Species: Escherichia coli (c; Species: Ba-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 02-Nov-2001 C; Accession: H91188 (c; Accession: H91188
                                A;Molecule type: DNA
A;Residues: 1-1588 <STO>
A;Residues: 1-1588 <STO>
A;Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:GN00145;
A;Experimental source: strain 0157:H7, substrain EDL933
C;Genetics:
A;Gene: Z5029
                                                                                                                                                                                                                                                                                                                                                     1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              : | :: : | :: |: | DTGIALGSSSVSSRVIAKGSRDTSITENGVVIGYDTTDGELLGALSIGDDGKYRQIIN-- 1159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----VADGSEAHDAVT-VROLONAIGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKT 1213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1274 APQNSVGEFSVGSADGQRQITNVAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLDNRVT 1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1043 DATY-IQENGAGINYVRTNDDGLAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDV 1101
                                                                                                                                                                                                                                                       21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           465
                                                                                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                  987 GAYNASHDGKASIITNVANGSISEDSTDAVNG----SQLNATNMMIEQNTQIINQLAGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125 TVHLNGIGSTLTDMLLLNTGA-TTNVTNDNV-----TDDEKKRAASVKD-----VLNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SVIKEK-------DGKLVTGKGKGE------NGSSTDEGEGLVTAKEVID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1214 IVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        265 AVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTKVTFASGNGTTATVSKDDQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --GNITVKYDVNVGDAL------NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKM---DETVNINAGNNIEITRN---GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSIQASMEGSVELET - - ISLSMTNDSKEFVDPY IVVTLKAGDNLKIKQNT - - - NENTNAS
                                                                                                                                                                                                                                                                                                                                                                                                  SFTYSLKKDLTGLINVET -- EKLSF -- -- -GANGKKVNIISDTKGLNFAKETAGTNGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK----KTEVKIGAKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1334 NLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALINGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQ------NLNNRIDNVNG
                                                                                                                                                                                                                                                       106;
                                                                                                                                                                                                          Length 1588;
                                                                                                                                                                                                     Score 377; DB 2; I
Pred. No. 2e-11;
; Mismatches 267;
                                                                                                                                                                                                                                                     88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ||:| : |: | ||
1573 NSQGEYSAALGAGIQW 1588
                                                                                                                                                                                                13.8%; 25.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NSRGHFGASASVGYQW 541
                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                              Similarity
          A;Status: preliminary
                                                                                                                                                                                                                                                     155;
                                                                                                                                                                                                  Query Match
Best Local S
Matches 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        228
                                                                                                                                                                                                                                                                                                     18
                                                                                                                                                                                                                                                                                                                                                                                                  73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 6
                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
          Sawasak
Silveir
A.L.; 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Distriction 16-Feb-2001 #text_change 14-Sep-2001
Cispecies: Distriction 186636
R;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhew
Iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apodaca,
Nature 409, 529-533, 2001
A;Title: Genome sequence of enterchemorrhagic Escherichia coli O157:H7.
A;Reference number: A85480; MUID:21074935; PMID:11206551
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Abuthors: da Silva, A.C.R.; da Silva, A.M.; Silva Jr., W.A.; da M.: Tsubako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A;Reference number: A59328
A;Contents: annotation
C;Genetics:
A;Gene: XF1529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1866
                                                                                                                                                                                                                                                                                                                                                                                                                                                1511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1747 GVGTQASGEGAAAVGSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRGAESYTGKY 1806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    504
                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                             7 EELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGD-NLKIKQNT
                                                                                                                                                                                                                                                                                                                                           EETDAVNFSQLKSISTAVD --- OGWTLTASGANGSK -- VASGGTVDLKNTDGNLTISKSG
                                                                                                                                                                                                                                                                                                                                                                                             NENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKV--NIISDTKGLNFAKETAGT---
                                                                                                                                                                                                                                                                                                                                                                                                                         : | : : | : : | : : | : : | : : DSNDVVFNLSEDLKEKSITVGNTQLDK----DGVKVSSNVLLDSNELVITSHSSTSSVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -NDNVTDDEKKRAASVKDVLNAGWNI------KGVKPGTTASDNVD-----FVRTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DTVEFLSADTK-----TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DVVFNLSKDFKVDEVTAGNTVVNTDGVKVG--SDVSLGAMGLFIANGPSVTASGFNAGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG------QADKFETV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 D-----QNSGWNLDS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----KAVAGSSGKVISGNVSPSKGKMDETVNINA---GNNIEITRN----GKNIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              389 ATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              449 LKGVAQNLNNRIDNVNGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----LNTGA--TTNVT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---NITVKY
                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                  201;
                                                                                                                                                                                                     Length 2059;
                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292 TSGTKVT-----FASGNGTT----ATVSKD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 541
                                                                                                                                                                                                     DB 2;
                                                                                                                                                                                                ; Score 392.5; DB 2
; Pred. No. 4.7e-12;
98; Mismatches 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---NGDTTVH---LNGIGSTLTDML-
                                                                                                                                                                                                  14.48;
24.88;
                                                                                                                                                                                                                      Best Local Similarity 24.8
Matches 173; Conservative
                                                                                                                                                                                                                                                                                                                                                1402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1629
                                                                                                                                                                                                                                                                                                                                                                                           99
                                                                                                                                                                                                                                                                                                                                                                                                                                        1457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   247
                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 5
                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
```

ĸ

U

д

and

```
submitted to GenBank, June 2000
A.Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Jungueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.W.F.; Marino, C.L.; Marques, M.V.; Martins A.Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; Balmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.S.; Sake A; Reference number: A59328
A; Reference number: A59328
A; Contents: annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | |:
SEGQTF-----VKVNSLNN-----SATPIAAGVDATAIGVGATAS 1032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        :: | | : | | | | : : : | | : | : : : | | : : : | | : : : | | : | : : : : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQL----QNSGWNLDSKAVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27 SVELE ---- TISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            668 TLGSTGLVITDGPSVTSSGISAG-NOKITNVAAGTADTDAVNFSQLQAVSSTASKGWNLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---------KETAG-------TNGDTTVHLNGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  727 ASGANSSNVAPGESVDLKNTDGNIVISKESGSNDVLFNLSSSLKLDKLTVGDTVMTTNGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG-WNIKGVKPGTTASD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            836 QLNTAMAGSGAKSVHYYSTYD-----GGTQGGNYNGDGATGTRSIAVGVGTLASA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DGKLVTGKGKGENG-SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EGATAVGSGAAASGKGSTAIGRNAVASADGSVALGD-GAKDGARGAESYTGKYSGLQNNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                945 VGTVSVGDASKGETRTVS----NVADAKEAT--DAVNLRQLDRVAQDANRYVDNKIESL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----PTLSVDDEGAL------NVGSKDANKPVRITNVAPGVKEGDVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VAQLKGVAQNLNNRIDNVNGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----TGLI-----NVETEKLSFGANGKKVNI---ISDTKGLNFA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SAIAVGVSSVSESGRWVFKFSGSANTRSQVGIGAGVGYQW 1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   502 AGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    13.5%; Score 368.5; DB 2; 23.9%; Pred. No. 3.8e-11; wiematches 213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best_Local Similarity 23.9
Matches 153; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: XF1981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   αq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΫ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c)
(Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C;Accession: A82615
R;Anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Sequen Nature 406, 151-157, 2000
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; MUID:20365717; PMID:10910347
A;Note: for a complete list of authors see reference number A59228 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Residues: 1-1190 <SIM>
A; Residues: 1-1190 <SIM>
A; Cross-references: GB:AE004017; GB:AE003849; NID:g9107083; PIDN:AAF84783.1; GSPDB:GN001
A; Cross-references: Strain 945c
B; Experimental Source: Strain 95c
B; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; ABriones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carrarr, D.M.; Carrer, Has-Neto, E.; Docena, C.; El-Dorry, H.; Facincanl, A.P.; Ferreira, A.J.S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   214 IVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVNSIAIGNGSTTTRGAQTNYTAYNMD 1273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1454 NITLGGGNGG-TTRISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTES 1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DATY-IQENGAGINYVRTNDDGLAFNDASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDV 1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1394 GSVATEENTISVGSSTNORRITNVAAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYS
                                                                                                                                                                                                                                                                                                                                                               GSIQASMEGSVELET -- ISLSMTNDSKEFVDPY IVVTLKAGDNLKIKQNT -- - NENTNAS
                                                                                                                                                                                                                                                                                                                                                                                                                         987 GAYNASHDGKASIITNVANGSISEDSTDAVNG----SQLNATNAMIEQNTQIINQLAGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SFTYSLKKDLTGLINVET -- EKLSF -- -- -GANGKKVNIISDTKGLNFAKETAGTNGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TVHLNGIGSTLTDMLLNTGA-TTNVTNDNV-----TDDEKKRAASVKD-----VLNAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK----KTEVKIGAKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SVIKEK-------DGKLVTGKGKGE-------NGSSTDEGEGLVTAKEVID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTKVTFASGNGTTATVSKDDQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --GNITVKYDVNVGDAL------NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQ-------NLNNRIDNVNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKM---DETVNINAGNNIEITRN---GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG
                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                        Score 377; DB 2; Length 1588;
Pred. No. 2e-11;
88; Mismatches 267; Indels 106;
                                                                                      A, Experimental source: strain 0157:H7, substrain RIMD C, Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ||:|:|:|:
|NSQGEYSAALGAGIQW 1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NSRGHFGASASVGYQW 541
                                                                                                                                                                                                                            13.8%;
25.2%;
                                                                                                                                                                                                                 Query Match
Best Local Similarity 25.2%
Matches 155; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Accession: A82615
A; Status: preliminary
A; Molecule type: DNA
                                                                                                                                                          A; Gene: ECs4480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1043
                                                                                                                                                                                                                                                                                                                                                               18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               526
                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
```

445

```
C;Accession: AH0110 C:Accession: AH0110 A:A H0110 A:A H0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nontypeable
                                                                                                                                                                                                                                                                                                                                                                                                                                          21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                       A;Status: preliminary
A;Moleoule type: DNA
A;Residues: 1-658 <KUR>
A;Cross-references: GB:AL590842; PIDN:CAC89747.1; PID:g15978974; GSPDB:GN00175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AKETAGTNGDTTVHLNGIGSTLT-------DMLLNTGATTNVTNDNVTDD 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             high-molecular-weight surface-exposed protein HWW1 - Haemophilus influenzae high-molecular-weight surface-exposed protein HWW1 - Haemophilus influenzae C; Species: Haemophilus influenzae C; Species: Ho-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 08-Oct-1999 C; Accession: A43855 | R; Barenkamp, S.J.; Leininger, E. R; Barenkamp, S.J.; Leininger, E. Infect. Immun. 60, 1302-1313, 1992 | A; Title: Cloning, expression, and DNA sequence analysis of genes encoding no detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     265 AVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---NYIGKYSNASNTSSGTVSVGNTATGETRTVSNVADG-----LQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     325 VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KNIDI--ATSMTPQFSSVSLGAGADAPTLS------VDDEGALNVGSKDANKPVRIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481 ANSATGGAGSVASGNNSTAFGSGAKATAANSAALGANSVADRANSVSVGSVGNER--QIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NVAPGVKEGDVTNVAQLKGVAQN----LNNRIDNVNGNAR-----AGIAQAIATAGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64 NTNENTNASSFTYSLKKDLTGLINVE----TEKLSFGANGKKV---NIISDTKGL---NF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ------LNAGW-----LNAGW-PDEVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----AASINTVGAQSSYSAYALTAPQASVGELGIGTALGNRKITGVAAGSASSDAVNVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --KEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STSTDAVVGSQLYNLVQDGTRYFHANSVNPTDSLASGLETIAVGPATVVSGDNGVGIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----TYDTVEFLSADTKTTTV--NVESKDNG------KKTEVKIGAKTSVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      174 ALVGAAATGGIAI---GFGTQVTAAGATAIGSAAQAQGAQSLALGAGAVTSQANSIALG-
                                                                                                                                                                                                                                                                                                                                                                                                                                          177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPASLASGNAALASGAGAVAIGDGAAASADGSVAIGQGSGDNGRGVE----
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Reference number: A43855; MUID:92192797; PMID:1548058
A; Accession: A43855
                                                                                                                                                                                                                                                                                                                                                                                          Score 321.5; DB 2;
Pred. No. 4.2e-09;
1; Mismatches 214;
                                                                                                                                                                                                                                                                                                                                                                                                                                          71;
                                                                                                                                                                                                                                                                                                                                                                                          11.8%;
ilarity 23.0%;
Conservative 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EKKRAASVKDV----
                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 138; Conserv
                                                                                                                                                                                                                                                                                                                                              A; Gene: YP00902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   433
                                                                                                                                                                                                                                                                                                                          C;Genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΟÝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                              Skelton, J.; Stevens, K., Salmonella enterica sero
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (strain C092) C;Species: Yersinia pestis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              951 LKASEAGSVRYETNADGSVNYSVLNLGDGSGGTTRIGNVSAAVNDTDAVNYAQLKRSVEE 1010
                                                                                                                                                                                                                                                                                                                                                 26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 448
            A; Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Ste A; Title: Complete genome sequence of a multiple drug resistant Salmonella enter A; Recession: A0502; MUD:21534947; PMID:11677608
A; Accession: A0502; MUD:21534947; PMID:11677608
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-1107 cPAR>
A; Residues: 1-1107 cPAR>
A; Cross-references: GB:AL513382; PIDN:CAD03303.1; PID:g16504923; GSPDB:GN00176
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SLAVGTDSLAMGAK----TIVNADAGIGIGLNTLVMADAINGIAIGSNARANHANSIAM 772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFV--- 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQN--SGWNLDSKAVAGSSGKVIS 355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 454 ----- GVAQ----- 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RTYDT-----VEFLSADTKTTTVN-----VESKDNGKKTEVKIGAKTSVIKE 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -ADKFETVTSGTKV 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GYDAVASGAGCLALGONSSSSIEGSIALGSGSTSNRAITTGIRETSATSDGVVIGYNTTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        : :::|| ::|
833 TDAQVSRNTQSITNLNTQVSNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OLYETHMLISOYNESISOLAGDISETY ITENGTGVKY IRTNDNGLEGODAYATGNGATAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----TBCLV----TA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNGSQTTRGAQTDYTAYNMDTPQNSVGEFSVGSEDGQRQITNVAAGSADTDAVNVGQLKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----DIATSMTPQF-----S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVSLGAGADAP-----TLSVDDE-GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----NLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGY
                                                                                                                                                                                                                                                                                                                                                                                                                             GLI-----DTTVHLNGIGS
                                                                                                                                                                                                                                                                                                                                                                                               ELETISLSMTNDSKEF-----VDPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDLT
                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                 256;
                                                                                                                                                                                                                                                                                              Length 1107;
                                                                                                                                                                                                                                                                                            Score 363; DB 2; Length 110; Pred. No. 6.6e-11; 95; Mismatches 239; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --SKGKMD---ETVNINAGN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ||| | : | | | : | : | : | : | : | | | AIGVSMVSESGGWVYKLQGTSNSQGDYSAAIGAGFQW 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233 KDGKLVTGKG---KGENGSSTDEG--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEVIDAVNKA----GWRMKTTTANGQTGQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -NIEITRNGKNI-----
                                                                                                                                                                                                                                                                                                 13.3%; 22.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LK------
                                                                                                                                                                                                                                                                                                                        Local Similarity 22.1 tes 167; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNVSP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    893
                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   398
                                                                                                                                                                                                                                                                                                                          Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Db
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ç
```

```
A;Gene: sapA2
                                                                      Matches
                                                       Best
                                                                                                                                             q
                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                  Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C; Species: Campylobacter fetus
C; Date: 03-Nov-1995 #sequence_revision 03-Nov-1995 #text_change 08-Oct-1999
C; Accession: A56143
R; Dworkin, J; Tummuru, M.K.R.; Blaser, M.J.
J; Bacteriol. 177, 1734-1741, 1995
A; Title: A lipopolysaccharide-binding domain of the Campylobacter fetus S-layer protein A; Reference number: A56143; MUID:95204338; PMID:7896695
A; Status: preliminary
             A;Molecule type: DNA_
A;Residues: 1-1536 CBAR>
A;Cross-references: GB:U08876; GB:W84616; NID:g475770; PIDN:AAA20527.1; PID:g475771
A;Note: sequence inconsistent with the nucleotide translation
A;Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .021 DSDATNNANLTIKTKELKLTQDLNISGFNKARITAKDGSDLTIGNTNSADG----TNAKK 1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              966 TNKNGDLNITNE--GSDTEMQIGGDVS---QKEGNLTISSDKINITKQITIKAGVDGENS 1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1231 GDIGGTISGGTVEVKATESLTT----QSNSKIKATT--GEANVT-----SATGT--IG 1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----TVNNNITSHK----AVSISATSGEITTKTGTTINATTGNVEITAQTGSILGGIE 1176
                                                                                                                                                                                                                                                                                                                                                   162
                                                                                                                                                                                                                       NFKAITNFTFNVGGLFDNKGNSNISIAKGGARFKDIDNSKNLSITTNSSSTYRTIISGNI 965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTF------ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVA 347
                                                                                                                                                                                                                                                                       SFTYSLKKDLT-----GLINVETEKLSFGANGK----KVNIISDTKGLNFAKETAGT--N 121
                                                                                                                                                                                                  72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      surface-array protein homolog sapA2 - Campylobacter fetus (strain 82-40 LP3)
                                                                                                                                                                                                                                                                                                                                                                      GSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLK----AGDNLKIKQNTNENTNAS
                                                                                                                                                                                                                                                                                                           ---FSIEKDLTLNATGGNITLLQVEGTDGMIGKGIVAKKNITFEGGNITFGSRKAVTEIE
                                                                                                                                                                                                                                                                                                                                               GDTTVHLNG----IGSTL-----TDMLLNTGATT---NVTN--DNVTDDEKKRAA
                                                                                                                                                                                                                                                                                                                                                                                                                      SVKDVLNAGWNIKGV------KPGTTASD------NVDFVRTYDTVEFLSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGK--------GENG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SSTDEGEGLVTAK----EVIDAVNKAGWRMKTTTAN------GQTGQADKFETVTSGTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  348 GSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIAT---SMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADAPTLSVD-DEGALNVGSKDANKPVRITNVAPGVKEGDVTNVA--QLKGV-AQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Status: preliminary
A;Molecule type: DNA
A;Rosidues: 1-1109 <DWO>
A;Crosz-references: GB:S76860; NID:g913763; PIDN:AAB33871.1; PID:g913764
A;Ncte: this gene appeared to be silent in strain 82-40 LP3
C;Genetics:
                                                                                                                          8.4%; Score 231; DB 2; Length 1536; 23.4%; Pred. No. 0.00049; ive 90; Mismatches 215; Indels 16
                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               || |||:
GTISGNT 1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTASGNS 527
                                                                                                                                           Local Similarity
nes 142; Conserv
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1127
                                                                                                                                                                                                18
                                                                                                                                                                                                                                                                                                           792
                                                                                                                                                                                                                                                                                                                                                                                                                                                          906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       405
                                                                                                                                                                                                                                                                       73
                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                      163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                461
                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        521
                                                                                                                                           Best Loca
Matches
                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
```

```
Sultace Expose Outer minimum and protein Arisin Limported Towner distincts of Stream Sultace Expose Outer minimum and the sequence_revision 20-Aug-2000 #text_change 20-Aug-2000 $\times \text{Caccession} \text{C82672}$

R; accompances The XYlella fastidiosa Consortium of the Organization for Nucleotide Seq Nature 406, 151-157, 2000

A; Title: The genome sequence of the plant pathogen Xylella fastidiosa.

A; Reference number: A82515; MUID:20365717; PMID:10910347

A; Note: for a complete list of authors see reference number A59328 below

A; Accession: C82672

A; Status: preliminary

A; Accession: C82672

A; Residues: 1-1004 <SIM>
A; Residues: 1-1004 <SIM>
A; Residues: 1-1004 <SIM>
A; Residues: 1-1004 <SIM>
A; Experimental source: strain 935c

R; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Carargo, L.E.A.; Carraro, Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.

Submitted to Genbank, June 2000

A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Franca, S.C.; Franco, M.C.; Fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           surface-exposed outer membrane protein XF1516 [imported] - Mylella fastidiosa (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                    330 DGSADVQNLKVNGVGAKGASVAITADKIETLNLN-TTGSQSFVSADVASISVKGNANLSL 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDD---EKKRAASVKDVLNAGWNIKGV 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NVGTATLASLEANINVSGEFKLGTTTAKGDVDFNIENVG-ALTLGAITSSTGNA-SVIIS 718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  348 GSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADA 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNW 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AQ---VIGGAAADDALTIIGKGDTQTITASGD---LSGGTLTLTLTEATKLSSLDISG-- 859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              389 ATGAKTTTLDASSFGGALDADLSTSASVTSIK---GGNGNDKITIKDV-AVNVAID-GGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | | : | | : | | : | | : | | : | | : | | | : | | | : | | | : | | | : | | | : | | | : | | | : | | | : | | : | | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : 
                                                                                                                                                                                                                                                          4 DEEEELESVQRSVVGSIQASMEGSVE-LETISLSMTNDSKEFVDPYIV-VTLKAGDNLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KONTNENT-NASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        178 -KPGTTASDNVDFVRTYDTVEFL--SADTKTTTVNVES------KDNGKKTEVKIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            546 KGKIVADKATELTINSNKVTLASDAVVQAANATKID----INAAKDTVGLTLGGVAKLTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    265 -AVNKAGWRMKTTTANG-----QTGQADKFETVTS------GTKVTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              602 LTVNNKG-AFALTGANATDLDSVKNLSVNTEGAFSIATATSLKNLNNLSLNGVSADLNSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NGTTATVSKDDQ------GNITVKYDV----NVGDALNVNQLQNSGWNLDSKAVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVT------NVAQLKGVA--QNLN
Score 225, DB 2; Length 1109;
Pred. No. 0.00064;
8; Mismatches 221; Indels 158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --GENGSSTDEGEGLVTAKEVID--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   719 SATGNVTLGAVSATQGNL----TLNAGNTL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KTSVIKEKDGKLVTGKGK-----
      8.2%; Sco
25.0%; Pre
tive 78;
                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         518 IIKGTASGN 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 960 -VKG-ITGN 866
                                                                   Similarity
                                                                   Local Simi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              303
      Query Match
```

us-09-771-382-34.rpr

```
A; Accession: AF0394
                                                                                                                                                                                  Local Simi.
hes 141;
                                                                                                                                                                 Query Match
Best Local S
Matches 141
                                                                                                                                                                                                                                                                 1166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1662
                                                                                                                                                                                                                                                                                                  71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1707
                                                                                                                                                                                                                                  27
                                                                                                                                                                                                                                                                                                                                                                                                                                  166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   383
                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, F. A.Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.A Rodrigues, V.; Rosa, A.J. de M.; de Rodrigues, V.S. Rosa, A.J. de M.; de Silva, V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveir A; Feference number: A59328 A; Contents: annotation C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tice, M.B.
ugan, G.;
Barrell,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              probable adhesin hmwA [imported] - Yersinia pestis (strain CO92)
C;Species: Yersinia pestis
C;Dacte: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
C;Accession: AF0394
R;Parkhill, J: Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, 11, M.; Rtherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barre A;Title: Genome sequence of Yersinia pestis, the causative agent of plague.
A;Teference number: AB0001; MUID:21470413; PMID:11586360
                                                                                                                                                                                                                                                                                                                                 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  601
                                                                                                                                                                                                                                                                                                                             114 SIAIGYFSKAFAPNAIAL --- GYNSSVTQSANNGVALGSNSTVS-----GVNSVA
                                                                                                                                                                                                                                                                                                                                                                 LSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDN
                                                                                                                                                                                                                                                                                                                                                                                             LGAGSMASELNVISVGGG-----DGVTGPAVRRIVNVG----DGIGNNDAVNKSQLDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                         11 VIASVNDVAASVKIIALINQVIGSSVASASGKESTAIGSGAQAVADN------TVAFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----LSADT ----KTTTVNVESKD-------NGKKTEVKIGAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GRAIANAVGASALGFDSHAKGINSTTVGTQSVSLGQGGVSLGYNSFVGEGSFNGLAGSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TSVIKEKDGKLVTGKG---KGENGSSTDEGEGL--VTAKEVI-----DAVNKAGWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MKTTTANGQTGQADKFETV - - TSGTKVTFASGNGTTAT - VSKDDQGNITVKYDVNVGDAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVNQLQNSGWNLD-----SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RANAIGSSALGVDGHALGANSTALGGQSTAISEGGTSLG---YNSFVGQSATNGIALGSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD-ANKPV--RITNVAPGVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EGDVTNVAQLKGVAQNLNN---RIDNVNGNAR---AGIAQAI---ATAGLVQAYLPGKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              542 NNDAVNKSQLDGVTASVNDVAASVKKIVGTIQITGSGVASAIGKDSTATGASAQAVGDSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----GGTYLGEAGYAIGYSSISAGGNWIIK-----GTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SLSMTNDSKEFVDPY IVVTLKAGDNLKIKQNTNENTN-ASSFTYSLKKDLTGLINVETEK
                                                                                                                                                                                                                                                                                                                                                                                                                                 VTDDEKKRAASVKDVL------NAGWNIKGVKPGTTA-SDNVDFVRTYDTVEF-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  382 GVTASVNDVVASVKNIAGAIQITGSGVASVSGQDSTAAGASAQAAGDSSIA----LGARS
                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                 163;
                                                                                                                                                                                                                                  Length 1004;
                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                               8.1%; Score 220.5; DB 2;
23.0%; Pred. No. 0.00096;
iive 76; Mismatches 236;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SGNSRGHFGA-SASVGY 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | | | ::||
LGTDAGVSGKDSIALGY
                                                                                                                                                                                                                                                al Similarity 23.0
142; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MAIG-----
                                                                                                                                                                                                 A; Gene: XF1516
                                                                                                                                                                                                                                                                                                                                                                                                                                 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                330
                                                                                                                                                                                                                                Query Match
Best Local S
Matches 142
                                                                                                                                                                                                                                                                                                                                                              93
                                                                                                                                                                                                                                                                                                                                                                                              191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               495
                                                                                                                                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                383
                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Óγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
```

```
1485
                                                                                                                                                                                                                                                                                                                                                               NVELNATAGNVSIYAETKTALSTSLNAVLSLGGNNSIKAQNGWLIGKAFNTTQGAGIGFR 1225
                                                                                                                                                                                                                                                                                                                                                                                                                                                         1337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1544 SGSGIGAQVNGSLSDSVVNGTSTNGIGVQINGSLKNSRINGISANGSGVKIDGESTLDNA 1603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1604 TLNGNSTEGKGVDLAANLSGNHGSVVHGDTVHGTGIDVGKDVTLSGGGTD--EPLTVSGN 1661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hypothetical protein 2 - Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Accession: T31105
R;Ward, C.K.; Lumbley, S.R.; Latimer, J.L.; Cope, L.D.; Hansen, E.J.
J. Bacteriol. 180, 6013-6022, 1998
A;Title: Haemophilus ducreyi secretes a filamentous hemagglutinin-like protein.
A;Reference number: 220984; MUID:99030326; PMID:9811662
A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                      116
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1910 <KUR>
A;Cross-references: GB:AL590842; PIDN:CAC92482.1; PID:g15981183; GSPDB:GN00175
C;Genetics:
A;Gene: hmwA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA.
A; Residues: 1-4919 <WAR>
A; Cross-references: EMBL:AF057696; NID:g3929021; PID:g3929023; PIDN:AAC79761.1
C; Genetics:
                                                                                                                                                                                                                                                                                                          70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1486 DLLILQGVATTGTGTGIKLNGNNDLSNT---SLNSSAVDGIALDITGPLANQGNVILNGTA
                                                                                                                                                                                                                                                                                                          SVELETI -- SLSMTNDSKEFVDPY IVVTLKAGDNLKIKQ -- -- -- NTNENT -- - N
                                                                                                                                                                                                                                                                                                                                                                                                                         ASSFTYSLKKDLTGLINVETEKLS-----FGAN-----GKKVNIISDTKGLNFAKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 117 TAGTNG-----DTTVHLNGI----GSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DVLNAGWNIKGVKPGTTASDNVDFVRTYDT - VEFLSADTKTTTVNVESKDNGKKTE - - - V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RISGNAAIVD-----TTLTGKSINGSGVKIDSLPGSSVVT-RSVLD------NAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --NQLQNSGWNLDSKAVAG-----SSGKVISGNVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APGVKEGDVTNVAQLKGVAQNLNNRIDN--VNGNARAGIAQAIATAGLVQAYLPGKSMMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KIGAKTSVIKEKDGKLVTGKGKGENGSSTD----EGEGLVTAKEVIDAVNKAGWRMKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         278 ANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSKG-----KMDETVNINAGNNIEITRN------
                                                                                                                                                                                               Length 1910;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 214; DB 2; L; Pred. No. 0.0047; 81; Mismatches 219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHF
                                                                                                                                                                                            7.8%;
22.1%;
                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                            Similarity
```

```
Query Match
Best Local Si
Matches 1399
                                                                                                                       69
                                                                                                                                                                                                                                                                                                                                                                                                                         330
                                                                                                                                                                                                                                                                                                                                                                                                                                                       433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       492
                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                      q
                                                                                                                     δ
                                                                                                                                                 q
                                                                                                                                                                                δ
                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A.Molecule type: DNA
A.Residues: 1-2149 <AND>
A.Cross-references: GB:M31227; NID:q152465; PIDN:AAA26380.1; PID:q152466
A.Note: the authors translated the codon GAT for residue 430 as Gly, and CAA for residue
C.Keywords: surface antigen; tandem repeat
F:1-20/Domain: signal sequence (uncleaved) #status predicted <SIGU>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 190K surface antigen precursor - Rickettsia rickettsii
C;Species: Rickettsia rickettsii
C;Date: 16-5ep-1992 #sequence_revision 16-5ep-1992 #text_change 08-0ct-1999
C;Accession: A41477
RAnderson, B.E.; McDonald, G.A.; Jones, D.C.; Regnery, R.L.
Infect. Immun. 58, 2760-2769, 1990
A;Title: A protective protein antigen of Rickettsia rickettsii has tandemly repeated, A;Reference number: A41477; MUID:90354033; PMID:2117568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SNKIAVLHSL------GNISLNSKDQVYNLGEIYAGNNISVKAHQLKNDVKLM 1049
                                                            32;
                                                                                                                     486
                                                                                                                                                 117
                                                                                                                                                                                544
                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KRAAS-----VKDV----VRTV 193
                                                                                                                                                                                                                                                                                               STLSAGELTFKKVKNVTLNNDSELAANNLSLNASHNVTLNNKSKLSAQKADIKAVNLTLN 663
                                                                                                                                                                                                                                                                                                                                                                                          KGK------GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFE 289
                                                                                                                                                                                                                                                                                                                                                                                                                     KGDIVSKDKATVTFSKNSDFTSNGSKLVNAQN-----QLKVNVNNFTISQGDDIT 773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N---INAGNNIEITRNGK--NIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK- 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DANKPVRITNVAPG------VKEGDVTNVAQLKGVAQ-NLNNRIDNVNGNARAGI 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |: |: | :: | :: | :: | SIKNLNISSEADFINNGTLEGIEALKIATKGNFTNKEKAILASNSLLDISVAEGK--KTF
                                                                                                         TINISNDVSLNNQSKLSANNLKIKKVRDLNLNNSELS--ANNLTLNTSNNITLKNKSKFT
                                                                                                                                                                                                            AGT ----NGDTTVHLNGIGSTLTDMLLNTGATTNVT -------NDDTVTDDEK
                                                                                                                                                                                                                                                                                                                                                     NLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKET
                                                                                                                                                                                                                             -----NVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---TVTSGTKVTFA-SGNGTTA-TVSKDDQGNITVKYDVNVGDALNV---NQLQNSG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIK------
                                                            Gaps
                                                          209;
                             Length 4919;
                                                          Indels
                                                                                     17 VGSIQASME-GSVELETISLSMTNDSKEFVDPYIVVTLKAGD-
                           Query Match 7.8%; Score 212.5; DB 2; Best Local Similarity 21.8%; Pred. No. 0.019; Matches 151; Conservative 85; Mismatches 248;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1050 GDITTKTKEGQASYKLYQASNGGHFGNDGSSGY 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----GTAS-----GNSRGHFGASASVGY 539
                                                                                                                                                                                                                                                                                                                                 DTVEFL - - SADTKTTTV - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1003
                                                                                                                                                                             487
                                                                                                                                                                                                            118
                                                                                                                                                                                                                                        545
                                                                                                                                                                                                                                                                       159
                                                                                                                                                                                                                                                                                                                                                             664
                                                                                                                                                                                                                                                                                                                                                                                                                      724
                                                                                                                                                                                                                                                                                                                                                                                                                                                    290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             945
                                                                                                                                                 58
                                                                                                                                                                                                                                                                                                  604
                                                                                                                                                                                                                                                                                                                                 194
                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 424
A;Gene: lspA2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 15
                                                                                                                    g
                                                                                                                                                 ŏ
                                                                                                                                                                            g
                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ά
                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
```

```
27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             : ||| || :| | |
----LPVTLNAGKSLTLNGN---N 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNASSFTYSLKKD-LTGLINVETEKLSFGANG------KKVNIIS--DTKGLNFAKE 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNV---TDDEKKRAASVKDVLNAGWN 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DAAINGT-----IGNTNALATVNVGAGTATLGGAVIKATTTKLTNAASVLTLTNANAV 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    224 GAKTSVIKEKDGKLVTG----KGKGENGSSTDEGEGLVTAK----EVIDAVNKAGWRMKT 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    276 TTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNIT---VKYDVN---VGDAL 329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377 --VQGGVVKANTINLTDNASAVTFT--NPVVVTGAIDNTGNANNGIVTFTGNSTVTGDIG 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINA--GNNIEITRNGKNID 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             388 IAT------SMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVA 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGVKEGDVINVAQLKGVAQNLNNRIDNVNGNARA----GIAQAIATAGLVQAYLPGKSMM 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          548 PVVVTGAIDNTG-----GAGTA 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              149 AVAANHGFDAPADNYTGLGNIALG----GANAALIIQSAAPSKITLAGNIDGGGIITVKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           174 IKGVKPGTTASDNVDFVRTYDTVEFLSADTKTT----TVNVESKD----NG---KKTEVKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | :| : :|| : :|| | : :|| | : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|| : :|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9 LESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNEN
                                                                                                                                                                            68; Mismatches 255; Indels 122;
         Length 2249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AIGGG-----TYLGEAGYAIGYSSISAGGNWIIKGTASGNSRG 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 595 TLGGAVIKATTTKLTNAASVLTLTNANAVLTGAIDNTTGGDNVG 638
7.7%; Score 210; DB 2; 23.8%; Pred. No. 0.0092;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        114 LNITQNTVVGSI--ITKGNL----
                                                                                 al Similarity 23.8
139; Conservative
```

Search completed: October 6, 2003, 09:33:32 Job time: 19.4863 secs us-09-771-382-34.rsp

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

October 6, 2003, 09:06:20 ; Search time 8.35443 Seconds Run on:

(without alignments) 3045.266 Million cell updates/sec

US-09-771-382-34

2735 1 TDEDEEEELESVQRSVVGSI......TASGNSRGHFGASASVGYQW 541 Perfect score: Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

127863 seqs, 47026705 residues Searched:

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt_41:* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	P15921 rickettsia	Q9kka3 r outer mem	Q53047 r outer mem	P33666 escherichia	P16466 proteus mir	Q52657 rickettsia			P35827 campylobact		P15320 serratia ma		P39180 escherichia	P32051 escherichia		_	4		Q8x8v7 escherichia	P52143 escherichia		escherich	ŝ		ű ~	-	Q07833 bacillus su		084419 chlamydia t	P56867 deinococcus	31	10	P45384 haemophilus
SUMMARIES	. QI	RICRI	OMPB_RICCN	OMPB_RICRI	YDBA_ECOLI	HLYA_PROMI	OMPA_RICCN	OMPB_RICJA	BIGA_SALTY	SLAP_CAMFE	ALYS_ENTFA	HLYA_SERMA	OMPB_RICTY	AG43_ECOLI	YDEK_ECOLI	ICEN_XANCT	SLAP_CAUCR	120K_RICRI	PVDB_PLAKN	YEEJ_ECO57	YPJA_ECOLI	OMPB_RICPR	YEEJ_ECOLI	FLIC_SHIFL	APU_THETU	YMJB_CAEEL	YS89_CAEEL	WAPA_BACSU	Y456_CHLTR	PMPC_CHLTR	HPI1_DEIRA	AIDA_ECOLI	IGAO_HAEIN	IGA2_HAEIN
	DB																																-	
	Length	2249	1655	1654	2003	1577	2021	1656	1953	933	737	1608	1645	1039	1325	1567	1025	1300	1153	2660	1569	1643	2358	220	1861	918	3178	2334	1005	1770	948	1286	1694	1702
æ	Query Match											•	•			•	•		•	•	•	•		٠	٠	٠			•	•	•	•	5.8	
	Score		206.5	201	198		189.5		184.5		179.5	179	179		175.5	173	172		170.5	170	168.5	166.5	166.5	166	-	9	163.5	9	160		159.5	159	159	159
	Result No.	-	7	m	4	S	9	7	œ	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33

				P45355 haemophilus P03275 human adeno		
Y741_CHLMU SLA1_BACAN	FLIC_SALBU PM10_CHLPN	VAC3_HELPY	FLA2_CAMJE	HXA3_HAEIN FIBP ADE02	PM20_CHLPN SP1_RAT	
1007	504 928	$\frac{1310}{512}$	575	917	1723 788	
5.7	5.7	5.7	0.0 0.0	0.00	5.0 .0	
156.5	155.5	155 154.5	154.5	154	152.5 152	
34	36	38	40	4 4 4 4 2 4	44 45	

ALIGNMENTS

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                      01-APR-1990 (Rel. 14, Created)
101-APR-1990 (Rel. 14, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein A precursor (190 kDa antigen) (Cell surface antigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              POTERTIAL.

OUTER MEMBRANE PROTEIN A.

13 X APPROXIMATE TANDEM REPEATS.

A (TYPE I).

B (TYPE II).

C (TYPE II).

E (TYPE II).

F (TYPE II).

G (TYPE II).

I (TYPE I).

G (TYPE II).

T (TYPE II).

G (TYPE II).

T (TYPE II).

I (TYPE I).

I (TYPE I).
                                                                                                     Rickettsia rickettsii.
Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiaceae;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pfam; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 3.
Antigen; Repeat; Signal; Cell wall; S-layer; Glycoprotein.
           PRT; 2249 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                          PIR; A41477; A41477.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                            MEDLINE-90354033; PubMed-2117568;
                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; M31227; AAA26380.1; -.
           STANDARD;
                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          212
212
212
287
359
359
431
506
578
653
725
800
875
           OMPA_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SIGNAL
OMPA_RICRI
```

~

```
Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                          27;
                                                                                                                                       148
                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                   376
                                                                                                                                                           TNASSFTYSLKKD-LTGLINVETEKLSFGANG------KKVNIIS--DTKGLNFAKE 116
                                                                                                                                                                                                                                                   223
                                                                                                                                                                                                                                                                        317
                                                                                                                                                                                                                                                                                                                                                              432
                                                                                                                                                                                                                                                                                                                                                                                    387
                                                                                                                                                                                                                                                                                                                                                                                                                              IAT-----SMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVA 435
                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                          491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                68
                                                                                                                                                                                                                      --VQGGVVKANTINLTDNASAVTFT--NPVVVTGAIDNTGNANNGIVTFTGNSTVTGDIG
                                                                                                                                                                                                                                                                                                                                                                                                                                            LNITQNTVVGSI -- ITKGNL--------N
                                                                                                                                                                                                     TAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNV---TDDEKKRAASVKDVLNAGWN
                                                                                                                                                                                                                                                  IKGVKPGTTASDNVDFVRTYDTVEFLSADTKTT----TVNVESKD----KKTEVKI
                                                                                                                                                                                                                                                                       LTGAIDNTTGGDNVGVLNLNGALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKL
                                                                                                                                                                                                                                                                                                                  TDAASAVKFTNPVVVTGAIDNTGNANNGIVTFTGNSTVTGNVGNTNALATVNVGAGLLQ-
                                                                                                                                                                                                                                                                                                                                                                                    NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINA - - GNNIEITRNGKNID
                                                                                                                                                                                                                                                                                                                                                                                                         NTNALATVNVGAGTATLGGAVIKATTTKLTNAASVLTLT-NANAVLTGAIDNTTGGDNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARA----GIAQAIATAGLVQAYLPGKSMM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVVVTGAIDNTG-----GAGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OWEB_RICCN STANDARD; PRT; 1655 AA.

OWEB_RICCN STANDARD; PRT; 1655 AA.

OWEB_RICCN (OSC45;
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
28-FEB-2003 (Rel. 41, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
CSUrface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(Comp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].

Rickettsia conorii.

Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
                                                                                                                9 LESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNEN
                                                                                                                                                                                AVAANHGFDAPADNYTGLGNIALG----GANAALIIQSAAPSKITLAGNIDGGGIITVKT
                                                                                                                                                                                                                                                                                             GAKTSVIKEKDGKLVTG----KGKGENGSSTDEGEGLVTAK----EVIDAVNKAGWRMKT
                                                                                                                                                                                                                                                                                                                                        TTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNIT - - - VKYDVN - - - VGDAL
                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Barbe V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E., Barbe
Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M.,
                                                                    Score 210; DB 1; Length 2249;
Pred. No. 0.0069;
Mismatches 255; Indels 12:
K (Trr.
L (TYPE II).
M (TYPE II).
TYPE I (TYPE II).
TYPE A9D6646C089DF087 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AIGGG-----TYLGEAGYAIGYSSISAGGNWIIKGTASGNSRG 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          595 TLGGAVIKATTTKLTNAASVLTLTNANAVLTGAIDNTTGGDNVG 638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
STRAIN-Malish 7;
MEDLINE-21442074; PubMed=11557893;
                                                                                          68;
 950 1021
1022 1093
1094 1165
1166 1180
2249 AA; 224333 M
                                                                    7.78;
                                                                                23.8%;
                                                                                          Matches 139; Conservative
                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=781;
                                                                                                                                                          69
                                                                                                                                                                                149
                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                       258
                                                                                                                                                                                                                                                                                                                  318
                                                                                                                                                                                                                                                                                                                                                                                   330
                                                                                                                                                                                                                                                                                                                                                                                                                              388
                                                                                                                                                                                                                                                174
                                                                                                                                                                                                                                                                                                                                        276
                                                                                                                                                                                                                                                                                                                                                                                                         133
                                                                                                                                                                                                                                                                                                                                                                                                                                                   492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               548
                                                                                                                                                                                                                                                                                                                                                             377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         436
                                              SEQUENCE
                                                                    Query Match
                                                                                 Sest Local
 REPEAT
REPEAT
REPEAT
                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OMPB_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 2
                                                                                                                à
   FFFFS
                                                                                                                                    g
                                                                                                                                                          ò
                                                                                                                                                                               g
                                                                                                                                                                                                       à
                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                              ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
```

```
between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         :| ||: :::| :| ||: || |::: |
287 NVTGSLGGNLKGIIEFNTVAVNGQ------LKANAGANAAVIGTNNGAGRAAGF 334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       75 TYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTV-HLNGIGS 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                74
                                                                                                                                                                                                                                                                                                         Stenos J., Walker D.;
"The rickettslal outer membrane protein A and B genes of Rickettsla australis, the most divergent rickettsla of the spotted fever group."; Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
--- FUNCTION: THE 120 KDA SURFACE EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A S-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIMILARITY).
FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR
                                                                                                                                                                 coding the outer-membrane protein rOmpB (ompB)."; J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                  R. prowazekii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete proteome.
120 kDa SURFACE-EXPOSED PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                "Mechanisms of evolution in Rickettsia conorii and Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    251;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7.6%; Score 206.5; DB
(3.0%; Pred. No. 0.0072
(ve. 73; Mismatches 2)
                                                                                                                                                                               "Phylogenetic analysis of members of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 2.
                                                                                                          STRAIN-Indian tick typhus, and Malish MEDLINE-20393643; PubMed=10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIR; E97835; E97835.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; AE008659; AAL03623.1; -. EMBL; AF123721; AAF34124.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AF123726; AAF34129.1; -. EMBL; AF149110; AAD39533.1; -.
                                                                                                                                                                                                                                                                  SEQUENCE OF 353-1655 FROM N.A.
                                                                                       SEQUENCE OF 33-1649 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Antigen; S-layer; Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1334
1655
61
75
78
251
                                                                                                                                                        Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               al Similarity
134; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1655
                                                                                                                                                                                                                                                                                         STRAIN-Malish 7
Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
```

m

```
144E
                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Op
                                                                                                                                                                             543
 -----NGKVATIDGQVYAKDMVIQSANAVGQVNFRHIVDVGT 376
                                                                                                                                                                                                        DKFETVT-----SGTKVTFASGNGTTATVSKDDQGNITVKYDV-----NVGDAL 329
                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                661
                                                                                                                                                                                                                                                                                                                              434
                                                                                                                                                                                                                                                                                                                                                                                                                   GKGVNL-YATNITTDA---NVGSFIFNAGGTNIVSG-----TVGGQQGNKFNTVALDN 770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s
                           TLTDMLLNTGATTNVT-NDNV-TDDEKKRAASV----KDVLNAGWNIKGVKPGTTASDNV
                                                       DGTTAFKTAASKVAITQNSNFGTTDFGNLAAQIIVPNTMTLNGNFTGDASNPGNTAG---
                                                                                                               --VITFDANGTLASASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSVFKLA
                                                                                                                                                                 NVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-DETVNIN---AGNN--IEITRNG
                                                                                                                                                                                                                                                                                                                            384 KNIDIATSMTPQ----FSSV----SLGAGADAPTLSVDDEGALNVGSKDANKPVRITNV
                                                                                                                                                                                                                                                                                                                                                        662 YLITRTINAAGQGKIIFNPVVNNNTTLATGTNLGS-ATNPLAEINFGSKGAANVDTVLNV
                                                                                                                                                                                                                                                                                                                                                                                       APGVKEGDVTNVAQLKGVAQNLNNRIDNVNG-NARAGIAQAIATAGLVQ-----AYLP
                                                                                     DFVRTYD---TVEFLSADTKTTTVN----VESKDNG-----KKTEVKIGAKTSVIKEK
                                                                                                                                                DGKLVTGK------GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA
                                                                                                                                                                                                                                                                                             SLTNAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGDVAINELVIGNNGAVQFAHNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BY A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDINE-2167802; PubMed-1724278; Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsia rickettsii is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gilmore R.D. Jr., Joste N., McDonald G.A.;
"Cloning, expression and sequence analysis of the gene encoding if a cloning, expression and sequence analysis of the gene encoding in 20 kD surface-exposed protein of Rickettsia rickettsii.";
Mol. Microbiol. 3:1579-1586(1989).
-i- FUNCTION: THE 120 kDa SURRACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
-i- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BILAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales.
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                GKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | :: :| |: | | : | | : | | | CTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADFVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mol. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-90136087; PubMed-2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 279-1654 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rickettsia rickettsii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
WSVD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPB_RICRI
                                                       377
                                                                                                                                                                                                                                                                                               602
                                                                                                                                                                                                                                                                                                                                                                                       135
                                                                                                                                                                                                                                                                                                                                                                                                                   721
                                                                                                                                                                          492
                                                                                                                                                                                                        286
                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                  487
                                                                                     188
                                                                                                                 434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 3
OMPB_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                       음
                                                                                  õ
                                                                                                               g
                                                                                                                                             δy
                                                                                                                                                                       q
                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                 ö
                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTV-HLNGIGS 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         434 --VITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSIFKLA 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DGKLVTGK-----GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DKFETVTSGTKVTFASGNGT-----NVG 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----NNIEITR-----NGKNI--DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAAGTNLGS-----ATNPLAEINF 706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSKDANKPVRITUVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNG-NARAGIAQAIATAG 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSKGVNVDT-VLNVGEGVNL-YATNITTTDA---NVGSFVFNAGGTNIVSG-----TVG 755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LVQ-----AYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRG 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DAKKTLTLGGANIIGAGGTIDLQANGGTIKLTST----QNNIVVDFDLAIATDQTGVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377 DGTTAFKTAASKVTITQDSNFGNTDFGNLAAQIKVPNAITLTGNFTGDASNPGNTAG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DALNVNQLQNSGWN-----LDSKAVA----GSSGKVIS-GNVSPSKGKMDETVNINAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           134 TLTDMLLNTGATTNVTNDN--VTDDEKKRAASVK--DVLNAGWNIKG--VKPGTTASDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NITGSLGGNLKGVIEFNTVAV----DGQ-----LTANAGAANAVIGTNNGAGRAAGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              335 VVSVD-------NGKVATIDGQVYAKDMVIQSANATGQVNFRHIVDVGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DFVRTYD----TVEFLSADTKTTTVN----VESKDNG-----KKTEVK1GAKTSVIKEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DGTVINGKVNOTALVGGALAAGTITLDGSATITGD--IGNAGGAAALQRITLAN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                120 kDa SURFACE-EXPOSED PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 201; DB 1; Length 1654;
Pred. No. 0.013;
9; Mismatches 228; Indels 15.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 38 · POLY-THR.
168184 MW; D7AB70FB7087F618 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32 kDa BETA PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YDBA_ECOLI STANDARD; PRT; 2003 AA. p3366; P76087; P76088; P76859; 01-FEB-1994 (Rel. 28, Created) 16-OCT-2001 (Rel. 40, Last sequence update)
                                                                                                                                                                                                                                                                                                 InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
Pfam; PF0379; Autotransporter; 1.
TIGRPAMS; TIGR01414; autotrans_barl; 2.
Antigen; S-layer; Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7.38;
                                                                                                                                                                                                                                                           EMBL; X16353; CAA34403.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1181 118
1654 AA;
                                                                                                                                                                                                                                                                                         S18227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      st Local Similarity
tches 136; Conserv
                                                                                                                                                                                                                                                                                         PIR; S18227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YDBA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 4
```

```
GIMTVIDPESIGIOVDG-DQAVVNNEGESAIINGGIGIQINGDDAIANNNGKTIVDGKDS 435
                                                                                                                                                                                                                                                                                         543 GI---VNLDGSLTVTGGAHGVENIGDNGTVNNKGDIVVSDTGSIGVLINGEGATVSNTGD 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ETVNINAGNNIEITRNGKNIDIATSM-TPQFSS-VSLGAGADAPTLSVDD------EGA 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------AQAIATAGLVQAYLPGKSMMAIGGGTYLGE------AQAIATAGYA 505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     717 SEVTSROSNLFDGSAEKTSGLV-VIGDGNTVNMNGGLELIGEKNALADGSQVTSLRTGYS 775
                                     ---- LNFAKETAGTNGDTTVH 127
 208 KWQYNHNGELVIT ---GDNATV--NNNGKTTVDG-----KDSTGTEINGNNGKVIQDGD
                                                                    LDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNNEGESTITNGGTGTQ
                                                                                                                                     160 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK-
                                                                                                                                                                                                                                                                   219 --TEVKIGAKTSVIKEKDGKL-VTGKGKG---ENGSSTDEGEGLVTAKE-----VIDA-
                                                                                                                                                                                                                                                                                                                                              ---VNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDD-----QGNI
                                                                                                                                                                                                                                                                                                                                                                               493 QAIVNNEG---ESTITNGGTG----TQINGNDAT-ANNSGKTTVDGKDSTGTKIAGNI
                                                                                                                                                                                                                                                                                                                                                                                                                       318 TVKYDVNVGDALNV----NQLQNSGWN--LDSK-----AVAGSSGKVISGNVSPSKGKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   500 VNVS-NEATGFSITTNSGKVSLAGSMQVGDFSTGVDLNGNNNSVTLAAKDLKVVGQKATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          418 LNVGSKDANKPVRITNVAPGVKEGDVTNVAQL---KGVAQNLNNRIDNVNGNARAGI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: Outer membrane.
MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS IN SHLA AND HPMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Uphoff T.S., Welch R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
                                                                                                                  LNG------IGSTLTDMLLNTGATTNVTNDNVTDD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation update)
                                     LSFGANGKKVNIISDT----KG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT; 1577 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OF 30-43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          776 YTSVIVVSGESSVYLNGDTTISG 798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              506 I-----GYSSISAGGNWIIKG 521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A., AND SEQUENCE (STRAIN=ISOlate 477-12;
MEDLINE=90170827; PubMed=2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Enterobacteriaceae; Proteus.
NCBI_TaxID=584;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-AUG-1990 (Rel. 15,
01-AUG-1990 (Rel. 15,
01-NOV-1990 (Rel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Proteus mirabilis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HLYA_PROMI
P16466;
                                                                                                                128
                                                                                                                                                                                                                              377
                                                                                                                                                                                                                                                                                                                                              997
                                       63
                                                                          257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 5
HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                              οy
                                                                                                                                                   g
                                                                                                                                                                                          ò
                                                                                                                                                                                                                              qq
                                                                                                                                                                                                                                                                   ōλ
                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                              δŽ
                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                       δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bloinformatics and the RMBL outstation the Buropean Bloinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@lab-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DKTEKTLTIRDSVF-TYTENADGTISLQDSNGRKATINLWQIDEANNTVALEGVSADGAT 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----DPYIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDLTGL-IN-----VETEK
                                                                                                                                                                                                                                                                                                                                                                                           Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh T., Kasal H., Rashimoto K., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K., Makade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Mamanoto Y., Horiuchi T., Farenchi Y., Makali K., Takeuchi Y., Makali K., Takeuchi Y., Rakeuchi Y., Makali K., Takeuchi Y., Moriuchi T., Saito N., Roriseponding to the Escherichia coli K.12 genome
                                                                                                                                                   SEQUENCE FROM N.A.
STAIN=NIZ / MG1655;
MEDLINE-97426617; PubMed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Rialey M., Collado-Yides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Moszer I., Glaser P., Danchin A.; "Multiple IS insertion sequences near the replication terminus in
                                                                          Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY: TO S.TYPHIMURIUM ORF NEAR CYSG (AC P25928).
GUTION: THIS IS A CONCEPTUAL TRANSLATION; THE GENE CODING
THIS PROTEIN IS INTERRUPED BY A HYBRID IS2D/IS30C ELEMENT
BETWEEN AMINO ACLIOS 839 AND 840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4 DEEEELESVQRSVVGSIQASMEGSVELE-----TISLSMTNDSKEFV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1; Length 2003;
                                                                                                                                                                                                                                                                                     "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            19 I -> V (IN REF. 2).
15 I -> V (IN REF. 2).
205949 MW; B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0.023;
   Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7.2%; Score 198;
23.1%; Pred. No. 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein; Complete proteome. 189 489 I -> V (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AE000237; AAC74483.1; ALT_SEQ. EMBL; AE000237; AAC74487.1; ALT_SEQ. EMBL; D90778; BAA15009.1; ALT_SEQ. EMBL; D90778; BAA18880.1; ALT_SEQ. EMBL; D90779; BAA18881.1; ALT_SEQ. EMBL; D9779; BAA18881.1; ALT_SEQ. EMBL; CSC66ne; EG11307; ydbA. Hypothetical protein; Complete proteom
                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-97251357; PubMed-9097039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=92190338; PubMed=1665988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 464-2003 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Escherichia coli K-12.";
Biochimie 73:1361-1374(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23.1%;
16-OCT-2001 (Rel. 40, Last
Hypothetical protein ydba.
YDBA OR B1401/B1405.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       corresponding to the 28.0 DNA Res. 3:363-377(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <del>:</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2003 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        al Similarity
158; Conser
                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                           Escherichia col:
                                                                                                                NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                              STRAIN-K12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=K12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Loc
Matches
 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
```

471

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the BMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ibb.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1020 GEGQTT-----DNALMETKAKGSQFTSNGDISINVGENAHYEGAQFDAQKGK---TV- 1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1069 INAGGDLTLAQATDTHSESQSNVNGSANLKVGT--TPE--SKDYGGGFNAGTTHHSKEQT 1124
                                                                                                                                                                                                                                                                                                                                                                                39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           371 INAGNNIEITR------NGK-NIDIATSMIPQFSSVSLGAGADAPTL-SVDDEG 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --FHITHTTHKNT-------STETEQANSTISGANVDLQAN-KDVTFAGS 739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SGENIQHLAVNDSETSKTDSLAVGIDVGVNLDYSGVTKPVKKAIEDGVNT-TKPGNNTDL 8999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 313 DQGNITVKYDVNVGDALNVNQLQNSGW--NLDSKAVAGSSGKVISGNVSPSKGKMDETVN 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417 ALNVGSKDANKPVRITHVVAPGVKEGDVTNVAQLKGVAQNLNNRID-------NV 463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNLKIKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFA-- 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --KETAGT-----T-T-134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              135 LTDMLLNTGATTNVTND-NVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVD--FVR 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              230 IKE---KD------GKLVTGKGKGENGSSTDE---GEGLVTAKEVIDAVN 267
                                                                                                                                                                                                                                                                                                                                                                                                                   26
                                                                                                                                                                                                                                                                                                                                                                                                                                                     544 NVIGSLIKSADKLGIHSLGDINVKSAQQVTKIDDEKTSLAITGHAKEVEDK----QYSAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QTEVTKNRGSQTEVAGDLTITAN-----KDLLHEG------ASHHVEGRYQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      192 TYDTVEFL----SADTKTTTVNV--------ESKDNGKKTEVKIGAKTSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    900 TKKVTARDAIANLANLSNLETPNVGVEVGIKGGGSQQSQTDSQAVSTSINAGKIDIDSNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         268 K---AGWRMKTT-----TANGQTGQA--DKFETVTSGTK----VTFASGNGTTATVSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           464 NGNARAGIAQAIATAGLVQAYLPGKSM----MAIGGGTYLGEAGYAIG---YSSISAGGN
                                                                                                                                                                                                                                                                                                                                                                                                                  SVVGSI------OASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAG
                                                                                                                                                                                                                                                                                                                                       Score 197; DB 1; Length 1577; Pred. No. 0.02; 94; Mismatches 190; Indels 240;
                                                                                                                                                                                                                                                                                                    165869 MW; 175975E0C924B2D9 CRC64;
MAY BE RESPONSIBLE FOR PURE FURMALLUM.
SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                       EMBL; M30186; AAA25657.1; -.
PIR; A35140; A35140.
Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                   HEMOLYSIN
                                                                                                                                                                                                                                                                                                                                       7.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1225 TINNSGNLTINGNS 1238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      517 WIIKG---TASGNS 527
                                                                                                                                                                                                                                                                                                                                                         al Similarity 22.3
150; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1183 SGGVQAGF-----
                                                                                                                                                                                                                                                                                   1577
                                                                                                                                                                                                                                                                                                  1577 AA;
                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                  15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      115
                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            57
                                                                                                                                                                                                                                                                                                                                                                              Matches
 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                   ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ζ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
```

OMPA_RICCN

RESULT 6

```
between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=Mallsh 7;
MEDLINE=94171067; PubMed=8125327;
Crocquet-Valdes P.A., Weiss K., Walker D.H.;
Crocquete analysis of the 190-kDa antigen-encoding gene of Rickettsia conorii (Mallsh 7 strain).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Differentiation of spotted fever group rickettsiae by sequencing and analysis of restriction fragment length polymorphism of PCR-amplified DNA of the gene encoding the protein rOmpA.";
J. Clin. Microbiol. 34:2058-2065(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Mechanisms of evolution in Rickettsia conorii and R. prowazekii.";
                                                                                                                       16-OCT-2001 (Rel. 40, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Outer membrane protein A precursor (190 KDa antigen) (Cell surface antigen) (rOmpA) (rOmp A).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=Malish 7;
MEDLINE=21442074; PubMed=11557893;
MEDLINE=21442074; PubMed=11557893;
MEDLINE=21442074; PubMed=11557893;
MEDLINE=21442074; PubMed=11557893;
Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M.,
Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OMPA_RICCN STANDARD; PRT; 2021 AA.
052657; P95591; P95592; P95593; P95594; Q52667; Q52668; Q52669;
052670; Q52674;
                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-Indian tick typhus, M1, Malish 7, and Moroccan; MEDLINE-97015921; PubMed-8862558; Roux V., Fournier P.E., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR006315; Autotransport.
Pfam; PF03797; Autotransporter; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; U01028; AAA17405.1; -. EMBL; AE008674; AAL03811.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; U43794; AAB49549.1; -. EMBL; U43798; AAB49550.1; -. EMBL; U43806; AAB49551.1; -. EMBL; U46244; AAB49566.1; -. EMBL; U46918; AAB496663.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 8-204 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; U83453; AAC35189.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       U83443; AAC35179.1
U83448; AAC35184.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  U83440; AAC35176.1
                                                                                                                                                                                                                                                                                               Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                    [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=781;
                                 TID DAYS BY BURNESS BY
```

~

```
33;
                                                                                                                                                                                                                                                                                                                                                     377 DGTTAFKTAASIVAITQNSNFGTTDFGNLAAQVTVPDTMTLTGNFTGDANNPGNTAG--- 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -- DATKTLTLGGANIISANGGTINFQANGGTIKLTS--TQNNIVVDCDLAIATDQTGVVD 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             328 ALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK---GKMDETVN----IN---AGNN 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --IEITRNGKNIDIATSMTPQ----FSSV----SLGAGADAPTLSVDDEGALNVGSKDA 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYL 485
                                                                                                                                                                                                                     334
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DGKLVTGK------GKGENGSSTDEGEGLVTAKEVIDAVNKAGWR--MKTTTANGQTG 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              284 QADKFETVT----SGTKVTFASGNGTTATVSKDDQGNITVKYDV-----NVGD 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --VITFAANGTLASASADANVAVTNNITAIEASGVGVVQLSGTHTAELRLGNAGSVFKLA 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                712 RADT-VLNVGEGVNL-YATNITTDA---NVGSFVFNAGGK------NIVSGTV 754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PGK----SMMAIGGGT---YLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      287 NVTGSLGGNLKGIIELNTVAINGQ------LIANAGPANAVIGTNNGAGRAAGF
                                                                                                                                                                                                                                                     TYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTV-HLNGI--
                                                                                                                                                                                                                                                                                     335 VVSVD--------NGKAATIDGQVYAKDMVIQSANANGQVNFRHIVDVGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15 SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSF
                                                                                                                                                                                                                                                                                                                                                                                         188 DFVRTY---DTVEFLSADTKTTTVN----VESKDNG-----KKTEVKIGAKTSVIKEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DGTVINGKVNQTVLVGGVLAAGAITLDGSATITG ----DIGNGGGGAALQSITLAN ---
                                                                                                                                                                                                                                                                                                                      -GSTLTDMLLNTGATTNVTNDNVTDDEKKRA-ASVKDVLNAGWNIKG---VKPGTTASDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gammaproteobacteria; Enterobacteriales;
                                                                                                                                   Pred. No. 0.071;
); Mismatches 229; Indels 154;
                               120 kDa SURFACE-EXPOSED PROTEIN.
                                                                                                                 DB 1; Length 1656; 0.071;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BIGA_SALTY STANDARD; PRT; 1953 AA. P25927; P25928; 09XCQ3; 01-MAY-1992 (Rel. 22, Created) 28-FEB-2003 (Rel. 41, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Putative surface-exposed virulence protein bigA precursor. BIGA OR STM3478.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Stojiljkovic I., Valentine P., Heffron F.;
"Salmonella typhimurium rhs homolog.";
Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases.,
                                                               33 POLY-GLY.
168097 MW; 3132A69C9DD5999F CRC64;
                                                  kDa BETA PEPTIDE
                                                                                                                 6.8%; Score 186; 22.7%; Pred. No. 0
TIGR01414; autotrans_barl; 2.
                                                                                                                                                 79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria, Proteobacteria, Gamma
Enterobacteriaceae, Salmonella.
NCBI_TaxID=602;
               S-layer; Cell wall.
1 1338
1339 1656
                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Salmonella typhimurium.
                                                                  533
                                                                                1656 AA;
                                                                                                                                 l Similarity
136; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-ATCC 14028;
                                               1339
528
TIGRFAMS;
               Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         234
                                                                                SEQUENCE
                                                                                                                 Query Match
                                                                                                                                                                                                                                                     75
                                                                                                                                     Local
                                                                DOMAIN
                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BIGA_SALTY
                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W FFF SO
                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98
STRAIN=LT2 / SGSC1412 / ATCC 700720;
MEDLINE=21534948; Pubbed=11677669;
MCCLelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P.,
Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D.,
Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulvaney E.,
Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M.,
Waterston R., Wilson R.K.;
"Complete genome sequence of Salmonella enterica serovar Typhimurium
                                                                                                                                                                                                                                 J. Bacteriol. 173:325-333(1991).
-!- CAUTION: Ref.3 sequence differs from that shown due to frameshifts
in positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    48 YIVVTLKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLI-----BKLSFGAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                             coli NADPH-sulfite reductase:
to overcome limiting siroheme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                PÔTENTIÀL.
POTATIVE SURFACE-EXPOSED VIRULENCE
POTATIVE DIGA.
15 X 11 AA TANDEM REPEATS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels 197;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99 GKKV-----NIISD-----TKGL-----NFAKETAGTNGDT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1953;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QYLE -> ITLQ (IN REF. 1).
SA -> T (IN REF. 1).
W; 611B3F1C954D91AE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 184.5; DB 1;
Pred. No. 0.1;
'; Mismatches 201;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15 (INCOMPLETE).
D -> DRGDDDVTPPDD (...
A -> R (IN REF. 3).
D -> N (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (INCOMPLETE).
(INCOMPLETE).
(INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Repeat; Signal; Complete proteome.
                                                                                                                                                                                 Wu J.Y., Siegel L.M., Kredich N.M.;
"High-level expression of Escherichia
requirement for a cloned cysG plasmid
                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; M64606; AAA27042.1; ALT_FRAME.
EMBL; M64606; AAA27043.1; ALT_FRAME.
Stygene; SG10437; bigA.
                                                                                                                                                                     MEDLINE=91100301; PubMed=1987123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24.08; F1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             200150 MW;
                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AF133696; AAD39458.1; -. EMBL; AE008859; AAL22340.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6.78;
                                                                                                                                            SEQUENCE OF 1-765 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                   Nature 413:852-856(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         514
1698
1798
1837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101
101
100
1104
1123
1134
1145
1145
1167
1178
1189
200
222
233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Simi
Matches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Virulence;
SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                         cofactor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
```

œ

```
01-0CT-1994 (Rel. 30, Created)
15-SEP-2003 (Rel. 42, Last seq
15-SEP-2003 (Rel. 42, Last ann
                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Firmicutes;
NCBI_TaxID=1351;
                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Beta-glycosidase).
                                                                                                                           133;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALYS_ENTFA
P37710;
                                                                                                                                                                                            09
                                                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                                                      159
                                                                                                                                                                                                                                                                                                            69
                                                                                                                                                                                                                                                                                                                                    213
                                                                                                                                                                                                                                                                                                                                                                                                                             329
                                                                                                                                                                                                                                                                                                                                                                                                                                                   602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           705
                                                                                                     Query Match
Best Local &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      446
                                                                                                                Best Loc
Matches
SSSSS ₹ ₹ 8
                                                                                                                                                                      qq
                                                                                                                                                                                            δλ
                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                              ga
                                                                                                                                                                                                                                                                                                            pp
                                                                                                                                                                                                                                                                                                                                 ŏλ
                                                                                                                                                                                                                                                                                                                                                         П
                                                                                                                                                                                                                                                                                                                                                                                δχ
                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                             δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                      ΩŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
          168
                                                                             535
                                                                                                     265
                                                                                                                                                318
                                                                                                                                                                      649
                                                                                                                                                                                            368
                                                                                                                                                                                                                  206
                                                                                                                                                                                                                                                                                     475
                                                                                                                                                                                                                                                                                                                                    513
                                                                                                                 424
                                                                                                                                                                                                                                                                                                            814
                                                                                                                                                                                                                                                                                                                                                       815 ILGDDSVVDVNVSYIPTGYYTYNALLMADGEGTSIENKGDITSHGVYSVIRADNGSEVSN 874
                                                                    GVVVGGNGNTVTLNGALNIDDNDLSATGGQYLDVVGLSVTGDDNDVEID--GGINI--TH
        --TVHLNGIGSTLT-------DMLLNTGAT-TNVTNDNVTDDEKKRAASVKDVL
                                                     NAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDN------GKKTEVK
                                                                                                   IGAKTSVIKEKDGK------LVTGKG-----KGENGSSTDEGEGLVT--AKEVI--DA
                                                                                                                                               VNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF-----ASGNGTTATVSKDDOGNIT
                                                                                                                                                                                           VKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV-ISGNVSPS-----KGKMDET
                                                                                                                                                                                                        VNINAGNNIEITRNGK-NI---DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD
                                                                                                                                                                                                                                                                                    ANKPVRITNVAPGVKEGDVTNVAQLKG---VAQNLNNRIDN---VNGN---ARAGIAQAI
                                                                                                                                                                                                                                                                                                   SEDPLDGTS-----ADITGIS-VSGNSTVTLNGHSTIDTNTVVGGHVVLARVNNGGSL
                                                                                                                                                                                                                                                                                                                                 -----ATAGLVQAYLP-----GKSMMAIGGGTYLGEAG-----YAI----GYSSISA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=91035477; PubMed=2229082;
Blaser M.J., Gotschlich E.C.;
J. Blol. Chem. 265:19372-19372(1990).
-1- FUNCTION: THE S-LAYER IS A PRARCRYSTALLINE MONO-LAYERED ASSEMBLY OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS CRITICAL FOR VIRULENCE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria; Epsilonproteobacteria; Campylobacterales;
Campylobacteraceae; Campylobacter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Surface array protein of Campylobacter fetus. Cloning and gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED S-LAYER WITH HEXAGONAL SYMMETRY.
                      01-JUN-1994 (Rel. 29, Last sequence update)
01-OCT-1994 (Rel. 30, Last annotation update)
S.layer protein (Surface array protein) (SAP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                               933 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A., AND SEQUENCE OF 1-20.
                                                                                                                                                                                                                                                                                                                                                                                            |: :: |:| : | SGDILVYATSSNSSEDRAAITRASG 899
                                                                                                                                                                                                                                                                                                                                                                               GGNWIIKGTASGNSRGHFGASASVG 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          structure.";
J. Biol. Chem. 265:14529-14535(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=84-32 / 23D;
MEDLINE=90354448; PubMed=2387868;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (Rel. 29, Created)
(Rel. 29, Last seq:
(Rel. 30, Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Blaser M.J., Gotschlich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Campylobacter fetus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=196;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLAP_CAMFE
P35827;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-JUN-1994
01-JUN-1994
                                                                                                                                                                                           319
                               455
                                                                           503
                                                                                                  223
                                                                                                                        536
                                                                                                                                              366
                                                                                                                                                                                                                650
                                                                                                                                                                                                                                      369
                                                                                                                                                                                                                                                             707
                                                                                                                                                                                                                                                                                                                                                                                                    875
                                                                                                                                                                                                                                                                                                          763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ERRATUM
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SLAP_CAMFE
                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
                                                                        g
                                                                                                                                           δ
                                                                                                                                                                  g
                                                                                                                                                                                                                Db
                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                             임
                                                    ò
                                                                                                  δ
                                                                                                                      g
                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                             ŏ
```

```
use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       115 KETAGINGDITVHLNGIGSILIDMLLNTGA-----158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        273 MKTTTANGQTGQADKF--ETVTSGTKVTFASGNGTTATVSK--DDQGNITVKYDVNVGDA 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            601
                                                                                                                                                                                                                                                                                                                                                                                                                                                59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KIKQNTNENTNASSFT-YSLK----KDLTGLINVETEKLSFGANGKKVNIISDTKGLNFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     356 TATNDTITLTSANAATSVNLKQRQAKDAT----ITSAMQQKYNNRNRIATITSAT--A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 TDEDEEEELESVQRSVVGSIQASMEGSVELETISLS-MTNDSKEFVDPYIVVTLKAGDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VENLTVKHATNVALNGGMDKLATVTLDNAALTAAIDIKSASTLNLINSSVNGPKHLYSSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----KRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----ATDQTVTLKANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            545 ALQSVSFGKTGQGGKFSVKTGTGDDKIEFV---GTTLTEGSVIDAPGNDTIAMKSAALTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LNVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ANFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAADTTLTINKDQVI-----N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               386 IDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V-----IDTGIETLNITSLVKATSPETTANTVNAKLTDVTSIIDGMQITLGHAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enterococcus faecalis (Streptococcus faecalis). Bacteria; Firmicutes; Lactobacillales; Enterococcaceae; Enterococcus.
                                                                                                                                                                                                                                                                                                      6.6%; Score 180; DB 1; Length 933;
22.8%; Pred. No. 0.071;
Live 69; Mismatches 231; Indels 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASOURNCE FROM N.A. MEDURG-1679432; MEDITURE-91358349; PubMed-1679432; Bellivau C., Potvin C., Trudel J., Asselin A., Bellemare G.; "Cloning, sequencing, and expression in Escherichia coli of Streptococcus faecalis autolysin.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15-SEP-2003 (Rel. 42, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
Autolysin precursor (EC 3.2.1.-) (Peptidoglycan hydrolase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; J05577; AAA23032.1; -.
Cell wall; S-layer.
SEQUENCE 933 AA; 96757 MW; F88C729B4BA5B1E9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    496 -GTYLG-----EAGYAIGYSSISAGGNWIIKGTASGNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   737 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RRYCKFKRAAA-------KVKLNTTA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
```

462

522

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
    202 DTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE-GEGLVTAK 260
                                                                                                                           316 NITVKYDVNVGDALN-----VNQLQNSGWNLDSKAVAGSSGKVI----SGNVSPSKG 363
                                                                                                                                                                                                                                                                                                                           -----NGGSN--NNQSGTNTYYIKSGDTLNKISAQFGVSVANLQAWNNISGSLIFA 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           644 ISAQFGVSVANLRSWNGI-----KGDLIFAGQTIIVKKG-----ASAGGNASSTNS 689
                                                                                                                                                                                                                                                                                                                                                                                                   603 GQKIIVKKGANSGSTNTNKP---TNNGGGATTSYTIKSGDTLN-----K
                                                    QYGVSVANLRSWNGISGDLIFVGQKLIVKKGASGN--TG-GSGSGGSNNNQSGTNTYYTV
                                                                                               261 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF---ASGN--GTTATVSKDDQG
                                                                                                                                                                                                                                                                                                                                                                      -----NVGSKDANKPVRITNVAPG-----VKEGDVTNVAQLKGVAQNLNNRIDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                              463 VNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGT
                                                                                                                                                                                                                                 494 GTNTYYTIKSGDTLNKIAAQYGVSVANLRSWNGISGDLIFAGQKIIVKKGTSGNTGGSS-
                                                                                                                                                                                                                                                                                 364 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV--DDEGAL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Poole K., Schiebel E., Braun V.; "Molecular characterization of the hemolysin determinant of Serratia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. SHLA REQUIRES SHLB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -! - FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             31 1608 HEMOLYSIN.
1608 AA; 165078 MW; D669B476FE7DAD51 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -!- SUBCELLULAR LOCATION: Outer membrane.
-!- SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT; 1608 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A., AND SEQUENCE OF 31-40.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIR; A28182; A28182.
Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  J. Bacteriol. 170:3177-3188(1988)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=88257037; PubMed=3290200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Enterobacteriaceae; Serratia.
NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M22618; AAA50323.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Serratia marcescens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        523 ASG 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     690 ASG 692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-APR-1990
01-APR-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HLYA_SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                           553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 11
HLYA_SERMA
                                               g
                                                                                               ð
                                                                                                                                     qq
                                                                                                                                                                                      δ
                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                    Dp
                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                              á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               between the Swiss Institute of Bioinformatics and the EMBL outstation. The European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.

STRAIN-V583 / ATCC 700802;

STRAIN-V583 / ATCC 700802;

MEDLINE-22550857; PubMed-12653927;

Paulsen I.T., Banerjei L., Myers G.S.A., Nelson K.E., Seshadri R.,

Read T.D., Fouts D.E., Eisen J.A., Gill S.R., Heidelberg J.F.,

Tettelin H., Dodson R.T., Umayam L., Brinkac L., Beanan M.,

Daugherty S., DeBoy R.T., Durkin S., Kolonay J., Madupu R., Nelson W.,

Vamathevan J., Tran B., Upton J., Hansen T., Shetty J., Khouri H.,

Utterback T., Radune D., Ketchum K.A., Dougherty B.A., Fraser C.M.;

"Role of mobile DNA in the evolution of vancomychn-resistant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SFGANGKKVNIISDTKGLNFA----KETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NDNVTDDEKKRAASVKDVLNAGWNIKG--VKPGTTASDNVDFVRTY-----DTVEFLSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SFODNAHVLKTISFQAGVYYYAGAWKSNISSYRDATAWLT --GRYAIDPSYNAKLNNVII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                  SUBCELLULAR LOCATION: Secreted (Probable).
DOMAIN: LYSM REPEATS ARE THOUGHT TO BE INVOLVED IN PEPTIDOGLYCAN
                                                                                                                                                                                                                                                                                                                  FUNCTION: Hydrolyzes the cell wall of E.faecalis and M.lysodeikticus. May play an important role in cell wall growth and cell separation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         208; Indels 109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 1; Length 737;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: BELONGS TO FAMILY 73 OF GLYCOSYL HYDROLASES. SIMILARITY: Contains 6 Lysm repeats.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hydrolase; Glycosidase; Bacteriolytic enzyme; Cell wall;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ABB16BD506AC7507 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S (IN REF. I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 0.057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      55; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.6%; Score 179.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     eat; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AUTOLYSIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LYSM 1.
LYSM 2.
LYSM 4.
LYSM 4.
LYSM 5.
LYSM 6.
LYSM 6.
A -> V (
A -> T (
S -> T (
C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MISSING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A --
Bacteriol. 173:5619-5623(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cell division; Septation; Repeat;
SIGNAL 1 53 POTEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR002901; Amidase_4.
InterPro; IPR002482; LysM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            77025 MW;
                                                                                                                                                                                                                                                                       Enterococcus faecalis.";
Science 299:2071-2074(2003).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; M58002; AAA67325.1; -.
EMBL; AE016949; AAO80613.1; -
PIR; A38109; A38109.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro, IPR002482; Lysm.
Pfam; PF01832; Anidase_4; 1.
Pfam; PF01476; Lysm, 5.
SMART; SM00257; Lysm, 6.
SMART; SM0047; LYSZ; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                363
4831
4831
6633
695
895
1118
143
4417
449
476
557
884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TIGR; EF0799;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

Page 10

```
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best_Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Dρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       500
                                                                                                                                                                                                                          546
                                                                                                                                                                                                                                                                                                                                                  211
                                                                                                                                                                                                                                                                                                                                                                                                                                   262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                100 -KKVNIISDTKGLNFAKETAGTNGDTTVHLNG-IGSTLTDMLL--NTGATTNVTNDNVTD 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -TVSK 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         764
                                                                                                59
                                                                                                                                                                               66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              460 IDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIG----GGTYL--GEAGYAIGYSSISA
                                                                                                                                      EKDKSSE-RGYQRNHTSSLRTGRWSNSDESESLKASELRSEGE-----LTLKAGRNVS
                                                                                                                                                                                                                                                                                                     DNKNN--SNRREISHASEL--TSGG-TLRLNGQQGVTITGSKARGQKGGEVTATHGGLRI
                                                                                                                                                                                                                                                                                                                                                  DEKKRAASVKDVLNA - - - - GWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVE
                                                                                                                                                                                                                                                                                                                                                                                          D--NALSTTVDKIDARTGTAFNI-----TSSSHKADNSYQSSTASELKSDTNLTLVSHK
                                                                                                                                                                                                                                                                                                                                                                                                                                 SKD-NGKKT----EVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVT----AKEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DADVIGSQVASGGELSVESKTGNINVK-----AAERQQNIDEQKTALTVNGYAKEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  263 IDAVNKAGWRM-----KTT-----KTTT----TANGQTGQADKFETVTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNKVSFLAADDKTASNTEQTKIGGGFYYTGGIDKLGSGVEAGYENNKTQAQSSKAITSGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DVKGNLT - - - - INARDKLTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG-----ALNVGSKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ANKPVRITN---VAPGVKEGDV-----TNVAQLKGVAQNLN----NR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSSEKRSSSSQAVVSSVQAGSIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSEAAANR
                                                                                                2 DEDEEEELESVQRSVVGSIQAS-MEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNL-
                                                                                                                                                                                 ----KIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANG--
                                                                                                                                                                                                                        501 TQGAKVHAQRDLTIDADNQIQVGVQKTANAKA-------VRDDKTSWGGIGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15-JUL-1998 (Rel. 36, Created)
15-JUL-1998 (Rel. 36, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
0uter membrane protein B precursor (168 kba surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) (Contains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompB); 32 kba beta peptide].
                                                         Gaps
                                  ed. No. 0.15;
Mismatches 232; Indels 224;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Próteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID=785;
                   Length 1608;
                   DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT; 1645 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GG-----NWIIKGTASGNSRGHFGASA 535
                 Score 179;
Pred. No. 0
                                                       81;
                                                         152; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTKVTFASGNGTTA-
                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A. STRAIN=Wilmington;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 typhi.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OMPB_RICTY
P96989;
                                                                                                                                                                                                                                                                                                         547
                                                                                                                                                                                                                                                                                                                                                  156
                                                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             514
                                                                                                                                      449
                                                                                                                                                                                                                                                                                                                                                                                        602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        881
                   Query Match
                                                                                                                                                                               9
                                        Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OMPB_RICTY
                                        Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 12
                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A PAC DE DE DATE OF THE PACE O
                                                                                                                                                                               δ
                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ç
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    75 TYSLKKDLFGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN-----GDTTVHL 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NGRDG--TGKLVLVSKNGNATEFNVTG------SLGGNLKGVIEFDTTAAAGK 310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    :|| :| | :| | :| 311 LIANGGAANAVIGTDNGAGRAAGFIVSVD-----NGNAATISGQVYAKDIVIQSANAGGQ 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGV-KPGTTA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----SDN-----VDFVRTYDTVEFLSADTKTTTVNVESKD-----NGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GEVKVSDKTFA----GIKTINIGDNQGLMFNTTPDAANALNLQGGGNTINF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLKIKQNTNENTNASSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGVGSIDFTAAPSV----LEFNLINPTTQ-----EAPLTLGDNAKIVNGANGILNITN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hackstadt T., Messer R., Cieplak W., Peacock M.G.;
"Evidence for proteolytic cleavage of the 120-kilodalton outer
membrane protein of rickettsiae: identification of an avirulent
mutant deficient in processing.";
Infect. Immun. 60:159-165(1992).
-!-FUNCTION: THE 120 kDa SURRACE-EXPOSED PROTEIN IS A MAJOR
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETISIAL
VIRULENCE FACTOR AND/OR IMMONOGEN DURING INFECTION.
-!-FUNCTION: THE 32 kDa BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR.
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
S-LAYER WITH HEXAGONAL SYMMETRY.
-!- SIMILARITY: BELONGS TO THE RICKETISIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
MEDLINE=94040787; PubMed=8224886;
Hahn M.-J., Kim K.-K., Kim I., Chang W.-H.;
"Cloning and sequence analysis of the gene encoding the crystalline
surface layer protein of Rickettsia typhi.";
Gene 133:129-133(1993).
                                                                                                                                                                                                                                                                                                 fragments of
                                                                                                                                                                                                             STRAIN-Wilmington;
MEDLINE-92114896; PubMed-1370573;
Ching W.M., Carl M., Dasch G.A.;
"Mapping of monoclonal antibody binding sites on CNBr fragments the S-layer protein antigens of Rickettsia typhi and Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Transmembrane; Cell wall.
1353 120 kDa SURFACE-EXPOSED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1; Length 1645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     32 kDa BETA PEPTIDE.

MEMBRANE ANCHOR (POTENTIAL).

H -> N (IN REF. 2).

V -> I (IN REF. 2).

G -> A (IN REF. 2).

G -> S (IN REF. 2).

G -> S (IN REF. 2).

WW; 0CB5641C7EB185EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                233; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0.16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                67; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 179;
Pred. No. 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; JN0896; JN0896.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
Pfam; PF03797; Autotransporter; 1.
TIGRFAMS; TIGR01414; autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               No.
                                                                                                                                                                                                                                                                                                                                                                                                                                             IDENTIFICATION OF CLEAVAGE SITE. MEDLINE=92104668; PubMed=1729180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 169698 MW;
                                                                                                                                                                                                                                                                                                                                                         prowazekii.";
Mol. Immunol. 29:95-105(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; L04661; AAB48987.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   146; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1353
1645
1429
657
842
1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Antigen; S-layer;
                                                                                                                                                                                     PARTIAL SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONFLICT
```

```
STRAIN=ML 308-225;
                                                                                                  STRAIN=K12 /
                                                                                                                                                                                                                                                                                                    CHAIN)
                                                                                                                                                                           GENE NAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CHAIN
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT
423
                               166 VTFEHLVDVGLGGKTN-FKTADSKVII----TENASFGSTDFGNLAVQIVVPNNKILTGN 420
                                                                                                              362 KGKMDET-------DIAT 390
                                                                                                 361
                                                                 -NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPS
                                                                                                                                                               534 AALQDITLANDASKILTLSGANIIGANAGGAIHFQANGGTIQLTSTQNNILVDFDLDVTT
                                                                                                                                                                                     391 SMTPQFSSVSL------GAGADAPTLSVDDEGALNVGSK-------
                                                                                                                                                                                                           DQTGVVDASSLTNNQTLTINGSIGTIGANTKTL----GRFNVGSSKTILNAGDVAINEL
                                                                                                                                                                                                                                424 -- DANKPVRIT-NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=K12;
MEDILINE-9751358; PubMed=9097040;
Itch T., Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K.,
Rasai H., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T.,
Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y.,
Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y.,
Yamamoto Y., Horluchi T.;
                                                     EVIDAVNK---AGWRMKTTTANGO--TGQADKFETVTS-----GTKVTFASG----
                                                                                                                                                                                                                                                      549 VMENDGSVHLTHNTYLITKTINAANQGKIIVAADPINTDTALADGTNLGSAESPLSNIHF
                                                                                                                                                                                                                                                                                                 709 ATKAANGDSILHIGKGVNL---YANNITTTDANVGSLHFRSGGTSIVSGTVGG 758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-K12 / MG1655;
MEDLINE-91426617; PubMed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V. Riley M., Collado-Videst J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Gramu B., Shao Y.;
"The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                      AG43_ECOLI STANDARD, PRT; 1039 AA.
P39180; P75614; P76360; P97241; Q46771;
01-FEB-1995 (Rel. 31, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Antigen 43 precursor (AG43) (Fluffing protein).
FLU OR B2000.
Escherichia coli.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                            181 VQAYLPGKSMMAIGGGTYLGEAGYA----IGYSSISAGGNWIIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "A 460-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-ML 308-225;
Henderson I.R., Owen P.;
Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases.
          KT----EVKIGAKTSVIKEKDGKLVTGKGKGENGS--STDEG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enterobacteriaceae; Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY SEQUENCE OF 53-78.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA Res. 3:379-392(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
STRAIN-K12 / MG1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=562;
                                                                                                                                                                                                           594
         218
                                                                                               303
                                                                                                                                                                                                                                                                                                                                    RESULT 13
                                                                                                                                                             g
                                                                                                                                                                                    ò
                                                                                                                                                                                                       q
                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                        g
                                                                                               ò
                                                                                                                    g
                                                                                                                                       οy
```

```
The properties of the properties of the properties of the properties of antigen of the properties of t
```

us-09-771-382-34.rsp

```
27;
                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        158 NRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGT----YLGEAGYAIGYS---- 509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSVEK-SGSGTLTVSNTTLTQKAVNL---NEGTLTLNDSTVTTDVIAQRGTALKLTGSTV 545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LFTARGGTLAGTTTLNNGAILTLSGKTVN-----NDTLTIREGD----ALLQGGSLTGN 489
                                                                                                                                                                                                                             67 TLANHDNOIVFGTINGMIISTGLEYGPDNE----ANTGGOWVQDGGTANKITVTSG--GL
                                                                                                                                                                                                                                                                                                                                               --- ATTNVTNDNVTDDEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           277 IVKNG-GVAGNTTVNQKGRLQVDAGGTATNVTLKQGGALVTSTAATVTGINRLGAFSVVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKAVAGSSGKVISGNVSPSK-----GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFS
                                                                                                                                                                                              52 TLKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGL
                                                                                                                                                                                                                                                                                    N-----VESKDNGKKTEVKIGAKTSV-----IKEKDGKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   159 KRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRT----------Y-YDTVEFLSADTKTTTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           386 --VLLADSGAAVSGTRSDGKAFSIGGGQADALMLEKGSSFTLNAG----DTATDTTVNGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         398 SVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN=-K12 / MG1655;
MEDLINE-97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
             47 QGT -> LGA (IN STRAIN ML 308-225).

55 S -> T (IN STRAIN ML 308-225).

88 Q -> L (IN STRAIN ML 308-225).

0 -> L (IN STRAIN ML 308-225).

5 -> I (IN STRAIN ML 308-225).

63 ETV -> TTT (IN REF. 5).

106841 MW, 5170D647C8DEEBEO CRC64;
                                                                                                                              6.5%; Score 177; DB 1; Length 1039;
21.1%; Pred. No. 0.11;
Live 74; Mismatches 221; Indels 153;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            VTGKGKGENGSSTDEGEGLVTAKEVIDAVN---KAGWRMKTTTANGQT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P32051; P76140; P77168;
01-0CT-1993 (Rel. 27, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Hypothetical lipoprotein ydek precursor (ORFT).
YDEK OR ORFT OR B1510.
                                                                                                                                                                                                                                                               112 NFAKETAGTNGDTTVHLNGIGSTLTDMLLNTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT; 1325 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----SISAGGNWIIKGTASGNS 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         546 LNGAIDPINVTLASGAIWNIPDNATVQS 573
                                                                                                                                                                 120; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                               1039 AA;
                                                                                                                                               Similarity
                 845
855
888
1025
61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDEK_ECOLI
                                                               VARIANT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                               209
                                                                                                                                                                                                                                                                                                                                                                                                                            217
                                                                                                                                                                                                                                                                                                                                                                                                                                                            238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            343
                                                                                               SEQUENCE
                                                                                                                                 Query Match
                              VARIANT
VARIANT
                                                                                                                                                  Local
               VARIANT
                                                                                                                                                                 Matches
                                                                                                                                                  Best
FFFFFS
                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                              合
                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to licenseeisb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |: :: | |: || : :|| |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: || |: |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           114 AKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWN 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 174 IKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104 -TITITSVIGANEDSEGTVNVLGGTWRLYDSGNNARPLNVGQSGTGTLNIKQKGHVDGGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16 VVGSIQASMEGSVELETISLSMTN-DSKEFVDPYI-----VVTLKAGDNLKIKQNTNE
                                                                                                                                                                                                                        K., Itoh T.,
                                                                                                                                                                                                                                                                                                                    ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 595-1325 FROM N.A. MEDINE-94100243; PubMed-8274505; MEDLINE-94100243; PubMed-8274505; Cartwright P.J., Timms M.W., Lithgow T., Hoej P.B., Hoogenraad N.J.; "An Escherichia coli gene showing a potential ancestral relationship to the genes for the mitochondrial import site proteins ISP42 and MOM38.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Biochim. Biophys. Acta 1153:345-347(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Potential).
-!- SIMILARITY: TO E.COLI YFAL.
-!- SIMILARITY: SOME, TO FUNGAL MITOCHONDRIAL IMPORT SITE PROTEINS
                                                                                                                                                                                                           Kasai H., Baba T., Fulta K., Hayashi K., Inada T., Isono K., Itch Kasai H., Rashimoto K., Kimura S., Kitakawa M., Kitagawa M., Maxino K., Miki T., Mizobuoli K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T., "A 570-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 28 0.440.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1325;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISP42 AND MOM38.
-!- CAUTION: REF.3 SEQUENCE DIFFERS FROM THAT SHOWN DUE TO A FRAMESHIFT IN POSITION 653.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-ACYL DIGLYCERIDE (POTENTIAL).
N -> K (IN REF. 3).
M -> S (IN REF. 3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTNASSFTYSLKKDLTGLINV - - ETEKL - SFGANGKKVNI - ISDTKGLN -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HYPOTHETICAL LIPOPROTEIN YDEK
                   complete genome sequence of Escherichia coli K-12."; nce 277:1453,1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1325 AA; 136514 MW; 26A3A066FA19AD7D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   163 LRLGSSTGGVGTVNVEGEDSVLTTELFEIG-SYGTGSLNITD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hypothetical protein; Membrane; Lipoprotein; Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       237;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.4%; Score 175.5; Di
23.4%; Pred. No. 0.18;
tive 69; Mismatches 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; A64905, A64905.
EcoGene; EG11780; ydeK.
PROSITE; PS00013; PROKAR_LIPOPROTEIN; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AE000248; AAC74583.1; -- EMBL; D90793; BAA15190.1; ALT_INIT. EMBL; D90794; BAA15197.1; ALT_INIT. EMBL; X73295; CAA51730.1; ALT_FRAME.
                                                                                                                                                   STRAIN=K12;
MEDLINE=97251357; PubMed=9097039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1325
1325
19
884
1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best_Local Similarity
Matches 135; Conserv
                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Complete proteome.
Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               884
1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONFLICT
                                                           Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOM38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN
                                The
qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        öλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

PROSITE; PS00314; ICE_NUCLEATION; 57.

Ice

```
the Swiss Institute of Bioinformatics and the EMBL outstation-
pean Bioinformatics Institute. There are no restrictions on its
non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration
DSSIEFQIGNOGTGEATIREGGLVTAENTIIGGNATG----IGTLNVQ-----DQDSVITV 290
                                                                                                                                                                     347
                                                                                                                                                                                                          387
                                                                                                                                                                                                                                                                                 442
                                                                                                                                                                                                                                                                                                                                                                                 294 GTKVTFASGNGTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWNL------ 341
                                                                                                                                                                                                                              402 YDGHGEMNISNQGLVVSNGGSSLGYGETGVGNVSITTGGMMEVNKNVYTTIGVAGVGNLN 461
                                                   234 DGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTS
                                                                                                                                                   291 RRLYNGYFGNG---TVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWNFLGTGEAFR
                                                                                                                                                                                                      342 -----DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIEITRNGKNID
                                                                                                                                                                                                                                                                               388 IATSMTPQFSSVSLGAGADAPTLSVDDEGALNV----GSKDANKPVRITNVAPGVKEGD
                                                                                                                                                                                                                                                                                                                                                       VINVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP--GKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ICE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Xanthomonas campestris pv. translucens.";
Mol. Gen. Genet. 223:163-166(1990).
-!- FUNCTION: ICE NUCLEATION PROTEINS ENABLE BACTERIA TO NUCLEATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CRYSTALLIZATION IN SUPERCOLED WATER.

CRYSTALLIZATION IN SUPERCOLED WATER.

SUBCELLULAR LOCATION: Outer membrane (By similarity).

DOMAIN: CONTAINS 153 IMPERFECT REPEATS OF THE CONSENSUS

OUTAREPTIOR A-G-Y-G--Y-T-L-T; FURTHER ON A 16 RESIDUE AND A

REGIONAL 48-RESIDUE PERVODICTIY IS SUPERIMPOSED.

MISCELLANEOUS: A STRUCTURAL MODEL IS SUGGESTED IN WHICH THE

NUCLEATION PROTEIN DISPLAYS A SYMMETRY RELATED TO THAT OF ICI

SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROPEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Xanthomonas campestris (pv. translucens).
Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales;
Xanthomonadaceae; Xanthomonas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved repetition in the ice nucleation gene inaX from
                                                                                                                                                                                                                                                                                                                                                                                                                                501 EAGYAI-----GYSSISAGGNWIIKGTASGNSR 528
                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1567 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               InterPro; IPR000258; Ice_nucleatn. Pfam; PF00818; Ice_nucleation; 81. PRINTS; PR00327; ICENUCLEAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=X56S;
MEDLINE=91080859; PubMed=2259339;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; X52970; CAA37140.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleation protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Zhao J., Orser C.S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
               -KG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=343;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the European
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ICEN_XANCT
P18127;
                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ICEN_XANCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ce
                                                                                                                         ò
                                                                                                                                                               셤
                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

```
1069
                                                                                                                                                                                                                                                                                                                                                                                                  970 LIAGYGSTQTSGS------DSSLTAGYGSTQTAREGSDVTAGYGSTGTAGAD 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15;
                                                                                                                          176
                                                                                                                                                                                       236
                                                                                                                                                                                                                     696
                                                                                                                                                                                                                                                                                                                   356
                                                                                                                                                                                                                                                                                                                                                                                416
                                                                                                                                                                                                                                                                                                                                                                                                                                             476
                                                                                                                                                        914
                                                                                                                                                                                                                                                                                                                                   1120 STQTAGYDSNLTAGYGSTQTAREDSSLTAGYGSTSTAGHDSSLIAGYGSTQTAGYNSILT
                                                                                                                        117 TAGINGDITVHLNGIGSTLIDMLLNIGATINVINDNVIDDEKKRAASVKDVLNAGWNIKG
                                                                                                                                              177 VKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGK
                                                                                                                                                                                                                     915 ----TAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDMTAGYGSTGTAGADST
                                                                                                                                                                                                                                                  237 LVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTK
                                                                                                                                                                                                                                                                                                                                                                                357 NVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                             417 ALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            477 TA-GLVQAYLPGKSMMAIGGGTYLGEAGY----AIGYSSISAGG--NWIIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                   297 VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISG
                                                                                            Gaps
                                                                                          90;
                                                             DB 1; Length 1567;
                                                                                          Indels
                             C8B451D959ECAD63 CRC64;
                                                                          20.8%; Pred. No. 0.29;
ive 67; Mismatches 220;
                                                             Score 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2003, 09:24:12
              nucleation; Repeat; Outer membrane.
/ENCE 1567 AA; 152548 MW; C8B451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1238 HESSLIAGYGSTQIAGYE 1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H-----FGASASVGYQ 540
                                                             6.3%;
                                                                        Best Local Similarity 20.88
Matches 91; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Search completed: October
Job time: 11.3544 secs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       530
                             SEQUENCE
                                                              Query Match
SQ SQ
                                                                                                                                                                                                                                                                                  QQ
                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                           ŏ
                                                                                                                                                        g
                                                                                                                                                                                       δý
                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                  δλ
                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ζ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                   ŏ
```

THIS PAGE BLANK (USPTO)

```
Q91718 neisseria m Q9333 neisseria m Q93470 neisseria m Q91ps8 neisseria m Q91ps8 neisseria m Q91ps8 neisseria m Q91pr7 neisseria m Q93471 neisseria m Q93471 neisseria m Q93471 neisseria m Q93471 heamophilus Q89m76 heamophilus Q89m77 heamophilus Q84m8 moraxella c Q8xd94 escherichia Q95268 salmonella Q95248 salmonella Q81628 salmonella Q81628 salmonella Q81628 salmonella Q8164 salmonella Q81628 salmonella Q81648 salm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
  neisseria m
neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF157609, AAK68870.1;
-InterPro: IPR005594; YadA.
InterPro: IPR005594; YadA.
SEQUENCE 592 AA; 61869 MW; F9403A0B4A18EEA7 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 IKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 TDEDEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
NhhA outer membrane protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; Score 2735; DB 2;
; Pred. No. 4.4e-106;
0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q8ZL64
Q9F2D8
Q8FCB2
Q9F3X5
                                                                                                                                                                                                                                                                                                                                                                                                                             09F3X6
09PD50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q8XDG4
Q9PC04
                                                 09JR18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                              Q9AQF0
Q9JPS8
Q9JPH0
                                                                                                                                                                Q9JPR7
Q93QY1
Q9JPI0
P71401
                                                                                                                                                                                                                                                              Q8GM76
Q8GM79
Q48152
Q8GM74
Q8GM75
Q8GM78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q8KQM9
                                                                       0930Y3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QBKQM8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity 100.0%;
Matches 541; Conservative 0
                                                 16
                                                                                                                                                                                                                                                                                                                                                                                                                                  16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16
  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=H41;
2339
2330.5
2330.5
2330.5
23315.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
22267.5
2226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q93QY2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 1
    293QY2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  093qy2 neisseria m
09jps9 neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              neisseria m
neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EEEEEEEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9jps9 neisseria m
Q9jqw4 neisseria
                                                                                                                                                         6, 2003, 09:13:10 ; Search time 39.7345 Seconds (without alignments) 3513.485 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         neisseria r
neisseria r
neisseria r
neisseria r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             neisseria
neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Description
                                                                                                                                                                                                                                                                                     2735
1 TDEDEEEELESVQRSVVGSI......TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                091ps2
091ps8
091ps0
093qy5
091pt0
091pr9
093qy4
093qy4
091ps3
091ps3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              09jpi3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              830525
                        GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                               830525 seqs, 258052604 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                    protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0930Y2
09JDW4
09JDW1
09JDPS
09JDPS
09JDP
09JDP
09JDPS
09JDPS
09JDPS
09JDPS
09JDPS
09JDPS
09JDPS
09JDPS
                                                                                                                                                                                                                                                                                                                                                          BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4: sp_humān:*
5: sp_invertebrate:*
6: sp_ammal:*
7: sp_mc:*
8: sp_organelle:*
9: sp_phage:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_unclassified:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sp_vertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sp_archea:*
sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_plant:*
sp_rodent:*
sp_virus:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sp_archeap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16
                                                                                                                                                                                                                                                                 US-09-771-382-34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPTREMBL_23:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sp_fung1:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query
Match Length
                                                                                                                                                                   October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2735
2735
26990
26990
26990
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
269000
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
269000
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
269000
26900
26900
26900
26900
26900
26900
26900
26900
26900
269000
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
269000
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
26900
269
                                                                                                                                                                                                                                                                                       Perfect score:
                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 0
                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                                                                                                                  seguence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Maximum
                                                                                                                                                                   Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ņ.
```

Mon

```
420
                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                             540
                             180
                                                                                    240
                                                                                                                                             300
                                                                                                                                                                                                      360
                                                                                                                                                                                                                               411
                                                        231
                                                                                                                 291
                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                        471
                                                                                                                                                                                                                                                                                                                                                531
                                                                                                                                                                                                                                                                                                                                                                                                        591
 112 IKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT 171
                                                                                                                                                                                                                                                                                                                                                                           172 NGDTTVHLNGIGSTLIDMLLNTGATINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                   NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                                                                                                                      SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                             KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                                                                                                                                             361 SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV
                                                                                                                                                                                                                                                                             SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDKGALNV
                                                                                                                                                                                                                                                                                                                      GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL
                                                                                                                                                                                                                                                                                                                                    TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                                                                                                                                                      s:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Kaapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C., Klee S.R., Morelli G., Basham D., Chillilingworth T., Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Ratharforam M.A., Rutherford K.W., Simmonds M., Skelton J., Whitehead S., Spratt B.G., Barrell B.G., Complete DNA sequence of a serogroup A strain of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Putative surface fibril protein (Outer membrane protein GNA992).
NMA1200 OR GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=22491 / Serogroup A / Serotype 4A;
MEDLINE=20222556; PubMed=10761919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=205900, BZ133, F6124, AND Z2491;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis (serogroup A),
Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseriaceae; Neisseria.
NCBI_TaxID=65699, 487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 404:502-506(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       meningitidis Z2491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             W 592
                                                                                                                                                                                                                                                                                                                                                                                                                                    W 541
                             121
                                                                                                                                             241
                                                                                                                                                                                                                                  352
                                                                                    181
                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q9JQW4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09J0W
                             òγ
                                                        g
                                                                                    ŏ
                                                                                                               g
                                                                                                                                             ò
                                                                                                                                                                         a
                                                                                                                                                                                                      ö
                                                                                                                                                                                                                              q
                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  291
                                                                                    300
                                                                                                  360
                                                                                                                                                         471
                                                                                                                                                                                                                                                           GSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGL 480
                                                                                                                                                                                                                                                                                        531
                                                                                                                                                                                                                                                                                                                    540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               111
 231
                                                                                                                                                                                                   SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNV 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IKONTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                         NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG
                                                                                                                                                                                                                                                                                                                   VQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQ
                          TTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTG
                                                                                   KGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFA
                                                                                                                                            SGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSP
                                                                                                                                                                                                                TDEDEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Capecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Moxon E.R., Grandi G., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ·,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61917 MW; 4A3471514FD3C879 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2690; DB 2;
Pred. No. 3.2e-104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=860800;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AF226361; AAF42510.1; -. InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  membrane protein GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98.4%;
llarity 98.5%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YadA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195; YadA;
592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                          541 W 541
                                                                                                                                                                                                                                                                                                                                                                                                   592 W 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pfam; PF0389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       533;
                          181
                                                                                 241
                                                                                                              292
                                                                                                                                                                     352
                                                                                                                                                                                                   361
                                                                                                                                                                                                                              412
                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                          301
                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                             09JPS9
                                                                                                              셤
                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                     g
                                                                                 ò
                                                                                                                                          ö
                                                                                                                                                                     g
                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ô
```

```
Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JPS2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 5
Q9JPS2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ογ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        φ
                                                                                                                                                                                                                                                                                                                                                                                            61 IKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGT 120
                                                                                                                                                                                                                                                                                                                                                                                                                                   171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATA 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      479 GLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVG 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TDEDEEEELESVQRSVVGSIQASMEGSVELETISLSMTNDSKEFVDPYIVVTLKAGDNLK
                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                 4;
                                                                                                                                                                                                                                            DB 16; Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis.
Badteiria, Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 В
                                                                                                                                                                                                                                                                                 23; Indels
"Identification of Vaccine Candidates Against Serogroup
                                                                                                                                                                                                     AD22E2F5EEF8F754 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9JPI3 PRELIMINARY; PRT; 594 AA.
Q9JPI3;
01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TEMBLrel. 15, Last sequence update)
01-OCT-2002 (TEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
                                                                                                                                                                                                                                        92.4%; Score 2527; DB 16
93.4%; Pred. No. 1.8e-97,
iive 9; Mismatches 2.
             Menigococcus by Whole Genome Sequencing.";
Science 287:1816-1820(2000)
EMBL: AL16275; CAB84461.1; -
EMBL: AF226357; AAF42266.1; -
EMBL: AF226365; AAF42514.1; -
EMBL: AF226386; AAF42522.1; -
EMBL: AF226386; AAF42535.1; -
InterPro; IPR005594; YadA.
                                                                                                                                                                                                     592 AA; 61745 MW;
                                                                                                                                                                                                                                                                             507; Conservative
                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                  Complete proteome
SEQUENCE 592 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                539 YQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 590 YOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              230
                                                                                                                                                                                                                                                                                                                    -4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              119
                                                                                                                                                                                                                                                                                                                                                       22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OCC NECONS 
RT RT DR RW XW
                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ΩD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Óγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
```

```
ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   532
                                                                                                                                                                                                                                                                                                                                                                                                                             52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 TDEDEEEELESVQRSV-VGSIQASMEGSVELETISLSMTNDS------KEFVDPYIVVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                 233 KDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             353 VISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                Dizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zoo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Tidentification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.", Science 287:1816-1820(2000).

EMBL; AF226376; AAF42525.1; -.
                                                                                                                                                                                                                                                                                                                                                                                       13;
                                                                                                                                                                                                                                                                                                                                                 DB 2; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                               01-0cT-2000 (TrEMBLrel. 15, Created)
01-0cT-2000 (TrEMBLrel. 15, Last sequence update)
01-0cT-2002 (TrEMBLrel. 22, Last annotation update)
01-tremembrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                               90.1%; Score 2464.5; DB 2; 90.7%; Pred. No. 7.2e-95; ive 11; Mismatches 27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AA.
                PubMed=10710308;
                                                                                                                                                                                                                                                                    InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                   Best Local Similarity 90.73
Matches 498; Conservative
STRAIN=NG3/88, and BZ232;
MEDLINE-20175756; PubMed-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              533 ASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASASVGYOW
```

```
QAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 TDEDEEEELESVQRS-VVGSIQASMEGSVELET---ISLSMTNDSKEFVDPYIVVTLKAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNLKIKQ - - - - NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIA
                                                                                                                                                                                                                                                                                                                                              outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                 pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducto M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Brocker M., Hunde E., Knapp B., Blair E., Mason T., Tettelin H., Moxon E.R., Grandi G., Rappuoli R.; Grandi G., Rappuoli R.; Marchetti D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Marchetti Condidates Against Serogroup B. Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                R., Jennings M.P.;
                                                                                                                                                                                                                                                                                                                                             novel
 01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992 (NhhA outer membrane protein)
                                                       Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                            STRAIN-H38;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings Indentification and characterization of a gene encoding a membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases. EMBL; AF126638; AR468869.1;
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA.
SEQUENCE 599 AA; 62844 MW; BBA16EBF53C1970C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              33; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  89.5%; Score 2447.5; DB 90.3%; Pred. No. 3.7e-94 ive 11; Mismatches 3
                                                                                                                       STRAIN=NGH38;
MEDLINE=20175756; Pubmed=10710308;
                                                    Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity 90.3 496; Conservative
                                         Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                          SEQUENCE FROM N.A.
                            GNA992 OR NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S:
Matches 496;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293
 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                    105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            585
                                                                                                                                                                                                                                                                                                                                                           22
                                                                                                                                                                                                                                                                                                                                                                          LKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FAKETAGINGDITVHLNGIGSTLIDMLLNTGATINVINDNVIDDEKKRAASVKDVLNAGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                          TDEDEEEEEESVQRSV-VGSIQASMEGSVELETISLSMTNDS-----KEFVDPYIVVT
                                                                                                                   Ś
                                                                                           Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Cananducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo M. Nuti S. Procker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                               13;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                               27; Indels
                                                                                                                                                                                                                               EMBL; AF226379; AAF42528.1; -.
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 594 AA; 62114 MW; 1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                                                                                                                    Score 2464.5; DB 2;
Pred. No. 7.2e-95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    599 AA
                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                               MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                             11;
                                                                                                                                                                                                                                                                                                    90.1%;
90.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15,
15,
                                                                                                                                                                                                                                                                                                               Best Local Similarity 90.7
Matches 498; Conservative
            Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ASASVGYOW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASASVGYQW
                                                      SEQUENCE FROM N.A.
                                                                  STRAIN-NGE31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-0CT-2000
01-0CT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              166
                                                                                                                                                                                                                                                                                                                                                                                    51
                                                                                                                                                                                                                                                                                                                                                                                                                                        901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     533
                                                                                                                                                                                                                                                                                                                                                                                                             53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JPR8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9JPR8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9JPR8
g
                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DI DI
                                                                                                                                                                                                                                                                                                                                                          å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

4;

56

410

2

408 465 468 525 585

Mon

ò q

```
SSGKVISGNVSPSKCKMDETVNINACNNIEITRNCKNIDIATSMTPQFSSVSLGAGADAP 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                106 LKAGDNLKIKQNTNENTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG
                                                                                EDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-------VVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53 LKAGDNLKIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDT
 SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAP
               AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSR
                                                                 TLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-BZ10;
STRAIN-BZ10;
STRAIN-BZ10;
Identification and characterization of a gene encoding a novel c membrane protein of Neisseria meningitidis.";
Submitted (JUW-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157603; AAK68864.1;
InterPro: IPR005594; YadA.
PÉAN: PF03895; YadA: 10.
SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                              (TrEMBLrel. 19, Created)
(TrEMBLrel. 19, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88.7%; Score 2426.5; DB 389.0%; Pred. No. 2.7e-93; ive 12; Mismatches 28
                                                                                                                                                                                                                                                                                                                 Ā
                                                                                                                                                                                                                                                                                                                                                                                                  NhhA outer membrane protein.
                                                                                                                                                                                                GHFGASASVGYQW 541
                                                                                                                                                                                                                 Local Similarity 89.0
hes 492; Conservative
                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                  01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                01-DEC-2001
01-OCT-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    346
                                406
                                                                 409
                                                                                                                                                               526
                                                                                                                                                                                                                                586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  229
349
                                                                                                                                  469
                                                                                                                                                                                                529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                   Q93QY5
                                                                                                                                                                                                                                                                                                                                                                                                                     NHHA.
                                                                                                                                                                                                                                                                                  RESULT
                                                                                                                                                               qq
                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                     δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ٥y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                              g
                                                               òγ
                                                                                            QQ
                                                                                                                                δ
                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTS 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LKAGDNLKIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDT 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF126381; AAF42530.1; -.
EMBL; AF157607; AAK68868.1; -.
EMBL; AF157607; AAK68868.1; -.
EMBL; FO3895; YadA.
SEQUENCE 598 AA; 62763 MW; E6C7AEF0BBBA63CB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TVV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                              Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 2; Length 598;
                                                                                                                                                 01-OCT-2002 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-ter membrane protein GNA992 (Nhha outer membrane protein).
GNA992 OR NHHA.
Neisseriam meningitidis.
Bacteria: Proteobacteria; Betaproteobacteria; Neisseriales;
NGBI TAXTD-4407.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3 EDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 88.7%; Score 2426.5; DB 89.2%; Pred. No. 2.7e-93; iive 11; Mismatches 28
                                                                                                                   ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                   598
                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                               STRAIN-NGH15;
MEDLINE-20175756; PubMed-10710308;
                                                                                                                                                (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                 PRELIMINARY;
 541
                 ASASVGYOW 599
ASASVGYOW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity
493; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                  NCBI_TaxID=487;
                                                                                                                                                01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-H15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    346
 533
                                591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                RESULT
```

5,

Gaps

21;

outer

108 165 168 225 228 285

à 엄 à g ŏ g ò q ò Q ò a

105

22

345 348

ဖ

465

528

```
346 ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG
                                              406 SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAP
                                                                                                           113 FAKETAGTINGDITVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGW
                                 SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAP
                                                                                           409 TLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR
                                                                                                                                                         AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3 EDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-----VVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.; "Identification and characterization of a gene encoding a novel outer membrane protein of Nelsseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Santini L., Scarla E., Raspo B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon B.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 2; Length 594;
                                                                                                                                                                                                                                                                                                                                             01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT membrane protein GNA992 (NhhA outer membrane protein).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           436BDDED68263C5C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      88.6%; Score 2423.5; DB 89.4%; Pred. No. 3.6e-93; tive 10; Mismatches 31
                                                                                                                                                                                                                                                                                                                                594 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
STRAIN-BZ198, and 297-0;
MEDLINE-20175756; Pubmed-10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; AF226358; AAF42517.1; -...
EMBL; AF127604; AAF42507.1; -...
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1...
SEQUENCE 594 AA; 62361 MW: A74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Science 287:1816-1820(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        491; Conservative
                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                    529 GHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-BZ198;
                                                                                                                                                       469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53
                                                                                                                                                                                                                                                                                                RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                           Q9JPH7
                                                             d
                                                                                                                       qq
                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                         δ
                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ΩD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5
 465
                              468
                                                                                                        108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVL 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG 348
SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAP
                                           NAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTS
                              TLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR
                                                                                          AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  286 VIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI-------VVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LKAGDNLKIKQNTNENTNA - - - SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi B., Manetti R., Marchetti E., Mora M., Nuti S Rati G., Santini L., Savino S., Scarselli M., Storni E., Zoo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Mocon B.R., Jeffiels A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappoul R., Grandi G., Rappoul R., Grandi G., Rappoul R., Grandi G., Belli G., Sanders M.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappoul R., Grandi G., Baptoli R., Bandingoccus by Whole-Genome Sequencing.", Science 287:1816-1820(200).

EMBL, AF226359; AAF425080.1; -. InterPro, IPR005594; Yada.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 2; Length 598;
                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis.
Batteria: Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62763 MW; 63A6A3BD7F0F2EE3 CRC64;
                                                                                                                                                                                                                                                                                                           Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88.7%; Score 2426.5; DB 89.0%; Pred. No. 2.7e-93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12; Mismatches
                                                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                                                PRT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                          membrane protein GNA992.
                                                                                                                                                                                                                                                                                      01-0CT-2000 (TrEMBLrel. 15, 01-0CT-2000 (TrEMBLrel. 15, 01-0CT-2002 (TrEMBLrel. 22,
                                                                                                                                                     541
                                                                                                                                                                                 GHFGTSASVGYOW 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              492; Conservative
                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                     GHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PF03895; XadA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-2996
                              409
                                                                                        469
                                                                                                                       526
                                                                                                                                                    529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ٣
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                        GNA992.
                                                                                                                                                                                                                                                              Q9JPT0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                OPTP0
                                                          원
                                                                                       ö
                                                                                                                     셤
                                                                                                                                                    à
                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                             ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
```

4

105 112 165 172

~

```
ä,
                                                                                                                                                                       285
                                                                                                                                                                                                           288
                                                                                                                                                                                                                                                345
                                                                                                                                                                                                                                                                                   348
                                                          168
                                                                                                                                228
                                                                                                                                                                                                                                                                                                                      405
                                                                                                                                                                                                                                                                                                                                                           408
                                                                                                                                                                                                                                                                                                                                                                                              465
                                                                                                                                                                                                                                                                                                                                                                                                                                     TLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                52
                                                                                                                                                                                                                                                                                                                                                                              166 KGLNFAKETAGTNGDPTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVL
                                                                                                                                                      LKAGDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLN
                                                                                                                                  NAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTS
                                                                                                                                                                                                           VIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
                                                                                                                                                                                                                                ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG
                                                                                                                                                                                                                                                                                                                                                             SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSR
                                                          KGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | :| :| || || :| || :: || :| || :| || :| || :| || TDDDDLYLEPVQRTAVVLSFRSDKEGTGEKE-----VTEDSNWGVYFDKKGVLTAGTIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 TDEDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDS------KEFVDPYIVVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      M.P.;
novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings P
coding a n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-EG327;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jenning "Identification and characterization of a gene encoding imembrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157605; AAK68866.1;
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA.
SEQUENCE 594 AA; 62297 MW; 9DDD48B04B3A8EA2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel. 19, Created)
(TrEMBLrel. 19, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 2404.5; DB Pred. No. 2.2e-92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ą.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        87.9%;
88.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NhhA outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GHFGASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity 88.7°
Matches 487; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseriaceae; Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-DEC-2001
01-OCT-2002
                                                                                                                                                                                                                                                                                                                        346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 526
                     106
                                                                                                                                169
                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                   289
                                                                                                                                                                                                                                                                                                                                                             349
                                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    106
                                                        109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0930Y4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0930Y4
                                                                                       g
                                                                                                                                                                  qq
                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                요
                                                      οy
                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŝ
                                                                                                                                292
                                                                                                                                                                                                                                                                                   412
                                                                                                                                                                                                                                                                                                                                                           472
232
                                                                                             285
                                                                                                                                                                     345
                                                                                                                                                                                                                                              405
                                                                                                                                                                                                                                                                                                                        465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LKAGDNLKIKQNTNENTNA----SSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDT 108
                                                                          NIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKE
                                                                                                                              KDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                    SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                          VISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV
                                                                                                                                                                                                                                                                                                  DDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIA
                                                                                                                                                                                                                                                                                                                                                                                                                                 QAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pizza M., Scarlato V., Massignani V., Giuliani M.M., Arico' B., Comenducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Moxon E.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.W., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EDEEEELESVQR-SVVGSIQASMEGSVELETISLSMTNDSKEFVDPYI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62718 MW; 9095F8E31AD7C76D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88.2%; Score 2412.5; Di
88.8%; Pred. No. 1e-92;
ive 10; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ā
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
STRAIN-NGH36;
MEDLINE-20175756; PubMed-10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Outer membrane protein GNA992 GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AF226382; AAF42531.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam; PF03895; Yada;
SEQUENCE 598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
les 491; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID-487;
                                                                                                                            233
                                                                                                                                                                  286
                                                                                                                                                                                                                                          346
                                                                                                                                                                                                                                                                                 353
                                                                                                                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53
                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                         413
                                                                                                                                                                                                                                                                                                                                                                                            466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 11
Q9JPR9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 ID DAT DE STANDER ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                      ò
                                                                                       d
                                                                                                                         δ
                                                                                                                                                                g
                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                QQ
                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

ω

ద

g ŏ g ò 셤 à a ö q ò 셤 ò g

```
4,
                                                                 175
                                                                                                                                    235
                                  164
                                                                                                224
                                                                                                                                                                   284
                                                                                                                                                                                                    295
                                                                                                                                                                                                                                   344
                                                                                                                                                                                                                                                                     355
                                                                                                                                                                                                                                                                                    345 NVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS 404
                                                                                                                                                                                                                                                                                                                                      415
                                                                                                                                                                                                                                                                                                                                                                    464
                                                                                                                                                                                                                                                                                                                                                                                                    475
                                                                                                                                                                                                                                                                                                                                                                                                                                     524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   584
                                                                                    405 GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    476 ATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASA
 GDNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAK
                  ETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIK
                                                                                                                                                                                                                     296 KVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDE
                                                                                                                                                                                                                                                                                                                                                                                                                     KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                      GALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : vi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Calactti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.K., Grandi G., Rappuoli R., Maningococus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .;
8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   600;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62762 MW; 36256963E0598CD1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   87.6%; Score 2397; DB 2;
89.4%; Pred. No. 4.6e-92;
iive 12; Mismatches 38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AF226371; AAF42520.1; -.
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pfam, PF03895; Yada;
SEQUENCE 600 AA; 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SVGYQW 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity
Matches 487; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=E26
 26
                                                                                                                                                                                                                                                                                                                                                                                                      416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     09JPS6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9SJL60
                                                                   ŏ
                                                                                              g
                                                                                                                                    δλ
                                                                                                                                                                 g
                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                    δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                     d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
FAKETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGW 172
                                                                 232
                                                                                VISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV 412
                                                                                                                                                                                                                                                                                    472
                                                                                                                                                                                                                                                                                                                                                                    525
                                                                                                                                                                                                                                                                                                                                                                                                    532
                                                                                                                                                                                                                                                                                                                                                                                                                    52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Barcolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti E., Marchetti E., Mora M., Nuti S.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
B Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000)
BRBL; AR422677; AA742277;
RILE-AF22677; AA74-2577.1;
RILE-AF2679; AA74-2577.1;
RILE-AF2679; YadA.
SEQUENCE 590 AA; 61661 MW; BAA476AC300DB0C8 CRC64;
                                                                                                                                                                                                                                                                                                                                                    FAKKTAETNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGW
                                                                 NIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKE
                                                                                                                                KDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT
                                                                                                                                                                                                                                                                                                                                                                                                  QAIATAGLVQAYLPGKSMMAIGGGTŸLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFG
                                                                                                                                                                                                SGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                   DDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 TDEDEEEELESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09JPS3;
01-CCT-2000 (TrEMBLrel. 15, Created)
01-CCT-2000 (TrEMBLrel. 15, Last sequence update)
01-CCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  87.8%; Score 2401; DB 2;
88.5%; Pred. No. 3.1e-92;
ive 21; Mismatches 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    590 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=NGE28;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity ... ies 483; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASASVGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=487;
                                                                                                226
                                                                                                                                                                                                                                 346
                                                                                                                                                                                                                                                                                                                                                                                                                                526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  533
                                                                                                                                233
                                                                                                                                                                 286
                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                 353
                                                                                                                                                                                                                                                                                                                                                                  466
                                                                                                                                                                                                                                                                                                                                 413
                                                                                                                                                                                                                                                                                                                                                                                                  473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09JPS3
```

å g

```
completed: October
ne: 40.7345 secs
            Similarity
                      471;
                                             21
                                                                   33
                                                                                                                                                                                                                                                       273
                                                                                                                                                                                                                                                                                                    333
                                                                                                                                                                                                                                                                                                                                                 393
                                                                                                                                                                                                                                                                                                                                                                                              452
                                                                                                               93
                                                                                                                                                                                                                                                                                                                          407
                                                                                                                                                                                                                                                                                                                                                                        467
                                                                                                                                                                                                                                                                                                                                                                                                                    527
                                                                                                                                                                                                                                                                                                                                                                                                                                          512
                                                                                          107
                                                                                                                                      167
                                                                                                                                                                                  227
                                                                                                                                                                                                                                287
                                                                                                                                                                                                                                                                              347
  Query Match
              Local
             Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       time
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Search
Job time
                                                                   g
                                                                                          Qγ
                                                                                                               ద
                                                                                                                                                          g
                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                              ò
                                                                                                                                       ò
                                                                                                                                                                                  ò
                                                                                                                                                                                                                                δy
                      116
                                                                                          176
                                                                                                                                                            296
                                                                                                                                                                                  296
                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                               416
                                                                                                                                                                                                                                                                                                   475
                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                 535
                                                                                                                                       236
                                                                                                                                                                                                                                 356
                                                                                                                                                                                                                                                                                                                                                                                              595
                                                                                                                                                                                              26
DEDEEEELESVQRSV-VGSIQASMEGSVELETISLSMTNDSKEFVDPYIV----VTLKAG
                  DNEEEEYLEPVVRTAPVLSFYSDAEDTGEKEV--TENTNWGIYFDKNGVIKAGTITLKAG
                                            DNLKIKQNTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIISDTKGLNFAKE
                                                        TAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKG
                                                                                                    VKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGK
                                                                                                                                                 137 VKPGTTASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGK
                                                                                                                                                                                  LVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTK
                                                                                                                                                                                                                                VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISG
                                                                                                                                                                                                                                            ALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA
                                                                                                                                                                                                                                                                                                                                      TAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASAS
                                                                                                                                                                                                                                                                                                                                                                                  NVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.

STRAIN-NG6/88;

MEDLINE-20175756; PubMed-10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,

Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
Outes membrane protein GNA992.
Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              54732 MW; F543C4234AF807CA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       r-2000 (TrEMBLrel. 15, Created)
r-2000 (TrEMBLrel. 15, Last sequence update)
r-2002 (TrEMBLrel. 22, Last annotation update)
membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ź
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Meningococcus by Whole-Genome Sequencing."
Science 287:1816-1820(2000).
EMBL; AR226377; ARR42526.1; -.
InterPro; IPR005594; Yada.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pfam; PF03895; YadA; SEOUENCE 526 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                   VGYQW 541
                                                                                                                                                                                                                                                                                                                                                                                                                                        VGYOW 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-0CT-2000
01-0CT-2000
                                                                                                                                                                                                                                                      357
                                                                                                                                                                                                                                                                                                                                                476
                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                   537
~
                     59
                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                                            357
                                                                                                                                                                                                                                                                                                   417
                                                                  117
                                                                                        117
                                                                                                                                                                                  237
                                                                                                                                                                                                         297
                                            27
                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 15
                                                              Dp
                                                                                                             g
                                                                                                                                                      셤
                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                                     õ
                                                                                                                                                                                                                                                                                                                                             pp
                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                       ò
                                                                                                                                    δ
                                                                                                                                                                                 δ
                                                                                                                                                                                                                           οy
```

```
2;
                                       106
                                                                                 166
                                                                                                   152
                                                                                                                         226
                                                                                                                                             212
                                                                                                                                                                  286
                                                                                                                                                                                      272
                                                                                                                                                                                                            346
                                                                                                                                                                                                                                 332
                                                                                                                                                                                                                                                      406
                                                                                                                                                                                                                                                                466
                                                                                                                                                                                                                                                                                                                   451
                                                                                                                                                                                                                                                                                                                                        526
                                                                                                                                                                                                                                                                                                                                                             511
                                                           92
                                                                                                                                                                             VTLKAGDNLKIKQ-----NTNENTNASSFTYSLKKDLTGLINVETEKLSFGANGKKVNIIS
                                                  DIKGLNFAKETAGTNGDITVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKD
                                                                                                                         VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAK
                                                                                                                                                                   TSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQAD
                                                                                                                                                                                                             KFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAV
                                                                                                                                                                                                                                                       AGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGAD
                                                                                                                                                                                                                                                                                               APTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGN
                    Gaps
                   5;
Length
DB 2;
        .6e-91
Score 2363.5;
Pred. No. 9.6e-
5; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                   09:30:48
                                                                                                                                                                                                                                                                                                                                                                                                                                    2003,
86.4%;
95.2%;
                                                                                                                                                                                                                                                                                                                                                                                             SRGHFGASASVGYQW 541
                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                     9
```

THIS PAGE BLANK (USPTO)

```
October 6, 2003, 09:05:45 ; Search time 39.6746 Seconds (without alignments) 1848.329 Million cell updates/sec
                                                                                                                                                                                  US-09-771-382-36
2350
1 TDETGLINVETEKLSFGANG......TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                           1107863
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                        1107863 seqs, 158726573 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                       OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                 length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                               Minimum DB seq
Maximum DB seq
                                                                                                                                                                                      Title:
Perfect score:
                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database :
                                                                                                                                                                                                                            Sequence:
                                                                                                                                                                                                                                                                                                                        Searched:
                                                                                                           Run on:
```

A_Geneseq_19Jun03:*

| SIDSI/gcgdata/geneseq/geneseqp-embl/AA1980.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp-embl/AA1981.DAT:*
| SIDSI/gcgdata/geneseqy-geneseqp-embl/AA1982.DAT:*
| SIDSI/gcgdata/geneseqy-geneseqp-embl/AA1983.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1983.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1985.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1985.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1985.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1985.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1989.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1989.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1989.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA1999.DAT:*
| SIDSI/gcgdata/geneseqy-embl/AA2000.DAT:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	N. meningitidis H4	A surface protein	N. meningitidis H4	A surface protein	A surface protein	N. meningitidis H1	N. meningitidis BZ	A surface protein	N. meningitidis H3
UMMARIES		AAU06183	23744	AAU06172	33738	33742	16177	16178	23743	92119
S	Ω	AAUC	AAY	AAU(AAY?	AAY	AAUC	AAUC	AAY?	AAU
	DB	22	20	22	20	20	22	22	20	22
	Length	513	592	592	598	598	598	598	599	599
dР	Query e Match Length DB I	100.0	99.4	4.66	96.2	96.2	96.2	96.2	96.2	96.2
	Score	2350	2337	2337	2261	2261	2261	2261	2260	2260
	Result No.	7	7	9	4	Ŋ	ø	7	80	6

25-JAN-2001; 2001WO-AU00069. 25-JAN-2000; 2000US-0177917.

02-AUG-2001.

10 11 12	01 C1 C1	95.6 95.6 94.2	594 594 512	20 22 22	AAY23739 AAU06179 AAU06182	A surface protein N. meningitidis BZ N. meningitidis PM
13	213	4 4		20	AAUU5182 AAY23740	tidis protei
14	2213	4		21	AAY57044	1 (1)
15	2213	4 4		25	AAU06174 AAY27202	N. meningitidis EG Amino acid seguenc
17	2210.5	4		20	AAY23741	A surface protein
8I 10	2210.5	7 7		20	AAY23746 AAH06171	
20	2210.5	4		22	AAU06175	
21	2207.5	mr		21	AAY57045	a .
23	2136	0		22	AAU06180	. mening
24	2116	00		20	AAY23745	A surface protein
72 76	2113	20		20	AAY27203	Amino acid sequenc
27	2032	9		22	AAU06186	N. meningitidis PM
7 A B	1861.5	200		22	AAU06181 AAU06185	N. meningitidis su N. meningitidis PM
30	1740.5	4		22	AAU06184	N. meningitidis PM
31	876	~ ~	(3)	17	AAR99393 AAR23860	Haemophilus adhesi
33	865	- 9	۰.	21	AAB23858	Haemophilus influe
34	849.5	9	-	17	AAR99392	Haemophilus adhesi
35	727	0 4		20	AAY27201	Amino acid sequenc
37	613	oψ		21	AAR39334 AAB23855	Haemophilus adnesi
38	580	4		21	AAB37832	Neisserial conserv
39	571.5	4		21	AAB23854	ω
4 0 €	7 6	~ ~		21	AAB23857 AAB23856	Haemophilus influe
42	511	-	1 1-1	21	AAB23859	
43	390.5	9 1	,	24	AAE30477	aemophilus inf
4 4 5	_	വാ	9 (7)	22	ABE/1294 AAB69136	M. catarrhalis sur M. catarrhalis les
					ALIGNMENTS	
	,					
AAU0618	83 83					
	06183	standard	d; Protein	in;	513 AA.	
	AAU06183;					
XX DT 24	-OCT-2001	÷	irst entry)	ζ.		
2	mon; no; +; d; e		ual Mbba		dolotion mutant	
	Surface an mutant; mu	antigen mutein.	NhhA; me	ning	meningococcal disease; meningitis	Lis vaccine;
OS Ne	Neisseria Synthetic.	meningitidi	ιΩ	strain	n H41.	
Σ , μ,	ey eptide		Location/Qualifiers 151	/Ona	lifiers	
,			/label=	Sign	al_peptide	
	Protein		52513 /label= /note= ".	Matu "Pred	_deletion_mutan ature protein,	t specifically
	WO200155182-81	2-41	,	5		
	0101007	. TU . 7				

us-09-771-382-36.rag

N

```
GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDVTNVAOLKGVAONLNNRIDNVNGNARAGIAOAIATAGLVOAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                               meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                      present sequence represents a surface protein of Neiserria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 592;
                                                                                                                                                                                                                                                                                                                   surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           422 EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                            glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99.4%; Score 2337; DB 20;
99.8%; Pred. No. 8.1e-139;
11ve 0; Mismatches 1;
 surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                          Claim 1; Page 118-120; 132pp; English.
                                                                                                                                                                                                                                                   Peak IRA;
                                                                                                                                                   98WO-AU01031.
                                                                                                                                                                              97GB-0026398
                                                                                                                                                                                                         INNOVATION LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 99.4
Best Local Similarity 99.8
Matches 460; Conservative
                            Surface protein; surface
                                                                                                                                                                                                                                                 Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis a meningitidis infections
                                                                                                                                                                                                                        QUEENSLAND
                                         immunoreactive peptide
                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                            1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          592 AA;
                                                                                                                                                                                                                                                                                         N-PSDB; AAX85796
                                                                                                                                                                                                         AIND ( DÖXD)
                                                                                            W09931132-A1
                                                                                                                                                   14-DEC-1998;
                                                                                                                                                                              12-DEC-1997;
                                                                                                                        24 - JUN - 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                                                                                                                                                                                      The
 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYL 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                        meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved anno acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain H41 surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                       TDETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTA
                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                            or
                                                                                                          Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                            New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treat.
                                                                                                                                                                                                                                                                                                                                                                                      DB 22; Length 513;
                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                              present invention relates to the isolation of novel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                 100.0%; Score 2350; DB 22;
100.0%; Pred. No. 1e-139;
iive 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ¥
                                                                                                                                                  Claim 12; Fig 6; 91pp; English.
                                                                                                                                                                                                                                                                                                                               antigen NhhA deletion mutant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
(UYQU ) UNIV QUEENSLAND
                           Peak IRA, Jennings MP;
                                                   WPI; 2001-488774/53.
N-PSDB; AAS09173.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY23744 standard;
                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
462; Conser
                                                                                                                                                                                                                                                                                                                                                          513 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                         Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAY23744;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           352
                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                              The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY23744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          q
ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XXXXXX
```

ö

Gaps

ö

ż

61

251

181

121

m

us-09-771-382-36.rag

요

```
122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
          The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh (AANU061292-AANU06186). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain #41 is 1 of 10 NhhA polypeptide sequences (AANU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            252 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                              2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2337; DB 22;
Pred. No. 8.1e-139;
0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAY23738 standard; Protein; 598
                                                                                                                                                                                                                                                                                                                               ;
0
                                                                                                                                                                                                                                                                                              99.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                               the present invention
                                                                                                                                                                                                                                                                                                              Local Similarity
nes 460; Conserv
                                                                                                                                                                                                                                                                592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY23738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                               Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Predicted mature protein, specifically
  claimed in claim 12"
                                                                                                                                                                                             meningitidis H41 surface antigen NhhA polypeptide sequence.
/label= C3
/note= "Conserved region 3"
:89..210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= C5
/note= "Conserved region 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .89.....
/label= V3
/note= "Variable region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                             'note= "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                       /label= C1
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         211..229
/label= C4
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                        label= Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                         52..592
/label= Mature_NhhA
                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                 ¥.
                                                                                                                                                                                                                                                            Neisseria meningitidis strain H41.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= V4
/note= "Variable
                                                                                             AAU06172 standard; Protein; 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                            51..102
/label- vl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'label - C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              label - V2
                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             03..114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 2001-488774/53.
N-PSDB; AAS09162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200155182-A1
                                                                                                                                                             24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02-AUG-2001
             552
                                                                                                                              AAU06172;
                                                                                                                                                                                                                                                                                                              Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein
                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
```

121 251

61

Gaps

ö

311 241 371 301

```
(first entry)
                                                                                                                                                                                                                                                 Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                       meningitidis infections
                                                             immunoreactive peptide
                                                                                    Neisseria meningitidis.
                                                                                                                                                                                                                                                                     WPI; 1999-418754/35.
N-PSDB; AAX85794.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
nes 446; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                            WO9931132-A1
                                                                                                                                                                                   12-DEC-1997;
08-SEP-1999
                                                                                                                                                            14-DEC-1998;
                                                                                                                                    24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Loca
Matches
염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                   NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                   The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to be used to use to vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                     Length 598;
                                                                                                                                                           for treating
                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 20;
                                                                                                                                                                                                                                                                                                                                                                    Score 2261; DB 20;
Pred. No. 4.9e-134;
                                                                                                                                                           Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                            4; Mismatches
                                                                                                                                                                                               Claim 1; Page 91-93; 132pp; English.
                                                                                                Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY23742 standard; Protein; 598
                                                                                                                                                                                                                                                                                                                                                                    96.2%;
ilarity 96.5%;
Conservative
           98WO-AU01031
                                  97GB-0026398
                                                          INNOVATION OUEENSLAND.
                                                                                              Jennings MP, Moxon ER,
                                                                                                                     WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
nes 445; Conserv
                                                                                                                                                                                                                                                                                                                                              598 AA
                                                                                                                                    N-PSDB; AAX85790
                                                          SISI (-SISI)
           14-DEC-1998;
                                  12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAY23742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
```

a ò g óλ g

ò

a

õ ద Qγ 엄

ö 셤

ò

ò

g

```
317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      258 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKDENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NTGATTINVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADTKTTTVNVESKDNGKKTEVK1GAKTSV1KEKDGKLVTGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                Surface protein; surface glycoprotein; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96.2%; Score 2261; DB 20;
96.7%; Pred. No. 4.9e-134;
live 3; Mismatches 12;
protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Page 108-110; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak
                                                                                                                                                                                                                                                                                                                                                                         (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                        97GB-0026398
                                                                                                                                                                                                                                                                             98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δy
```

ö

557

498

Ŗ.

AAY23742;

S

ö

Gaps

; 0

Length 598; Indels 61

121 257 181 317 241 377 301 437 361

```
characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain H15 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                              ADTRITTUNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                             RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                  2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                           242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Surface antiqen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             meningitidis BZ10 surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 22;
                                                                                                                                                                                            12;
                                                                                                                                                                              Pred. No. 4.9e-134, 3; Mismatches 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= Cl
/label= Cl
/^ate= "Conserved region l"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Conserved region 1"
51..104
7.1abel= V1
/note= "Variable region 1"
105..116
                                                                                                                                                                    Score 2261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ä.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis strain BZ10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAU06178 standard; Protein; 598
                                                                                                                                                                                           3;
                                                                                                                                                                   96.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                           Conservative
                                                                                                                     the present invention.
                                                                                                                                                                   Query Match
Best Local Similarity
Matches 446; Conserv
                                                                                                                                              598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Veisseria
                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                              Sequence
                                                                                                                                                                                                                                        138
                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU06178;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAU06178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              888888888888%8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                á
                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06182-AAU06186). The modified or mutant Nhha polypeptides are
                                                                                                                                                                                         Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                  N. meningitidis H15 surface antigen NhhA polypeptide sequence
             EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                           /more.
/label- v2
/~re= "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5
                                                                                                                                                                                                                                                                           'note= "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                      /Jabel= V3
/note= "Variable region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= V4
/note= "Variable region 4"
                                                                                                                                                                                                                                                                                                              region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                     "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                 "Conserved region
                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                               Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label= C4
/note= "Conserved
                                                                                                                                                                                                                  Neisseria meningitidis strain H15.
                                                                                                                                                                                                                                                                                                               'note= "Variable
                                                                                              AAU06177 standard; Protein; 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                 /label= V1
                                                                                                                                                                                                                                                                                                                                     C_2
                                                                                                                                                                                                                                                              /label= Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                 .216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598
                                                                                                                                                                                                                                                                                     ..104
                                                                                                                                                                                                                                                                                                                          .116
                                                                                                                                                                                                                                                                                                                                    'label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                        note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2001-488774/53.
N-PSDB; AAS09167.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak IRA, Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WO200155182-A1
                                                                                                                                            24-OCT-2001
             422
                                  558
                                                                                                                    AAU06177;
                                                                                                                                                                                                                                        Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                 AAU0617
                                                                     RESULT
                                                                                                          õ
                                  g
```

421 557

us-09-771-382-36.rag

```
361
                                                                                     301
     258 ADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 317
                                                                                                                                                                                               GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                            RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                          EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                     242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               humans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerse, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                     EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2260; DB 20;
Pred. No. 5.6e-134;
                                                                                                                                                                                                                                                                                                                                                                                                                                     A surface protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 1; Page 114-115; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peak IRA;
                                                                                                                                                                                                                                                                                                                                                  AAY23743 standard; Protein; 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96.2%;
96.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98WO-AU01031.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 97GB-0026398.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INNOVATION LTD.
                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (ISIS-) ISIS INNOVATION (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 1999-418754/35.
N-PSDB; AAX85795.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              599 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9931132-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                          08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-JUN-1999
                                                                                                                                                                                               362
                                                                                                                                                                                                                                                       422
                                                            318
                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                               AAY23743;
                                  182
                                                                                                                                                                                                                                                                                 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                          RESULT 8
                                                                                                                                                                                                                                                                                                                                        AAY23743
                                                          pp
                                                                                                               qq
                                                                                                                                                                                                                          QQ
                                                                                                                                                                                                                                                                                                                                                                 δy
                                                                                     Qγ
                                                                                                                                            δy
                                                                                                                                                                     g
                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKCKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhA (AA006182-AA006186). The modified or mutant NhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The present sequence representing the wild type surface antigen NhA from N. meningitidis strain B210 is 1 of 10 NhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from
Neisseria meningitidis, useful in producing vaccines for treating or
preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .
,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 2261; DB 22;
Pred. No. 4.9e-134;
4; Mismatches 12;
                                                             /note-
/131..194
/label= C3
/~ate= "Conserved region 3"
                                                                                                                                            /noue=
217...23
/label- C4
/label- C4
Conserved region 4"
/label= C2
/note= "Conserved region 2"
                                                                                                                                                                                                                                   243..598
/label= C5
/note= "Conserved region 5"
                                                                                                              95..216
|label= V3
|note= "Variable region 3"
                                                                                                                                                                                                                          4.
                                                          5
                                             label= V2
note= "Variable region
                                                                                                                                                                                                            /label= V4
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96.2%;
96.5%;
                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                            25-JAN-2000; 2000US-0177917
                               ..130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 96.2
Best Local Similarity 96.5
Matches 445; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                  Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB; AAS09168
                                                                                                                                                                                                                                                                                            WO200155182-A1.
                                                                                                                                                                                                                                                                                                                       02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                Region
                                                                       Region
                                                                                                                Region
                                                                                                                                                        Region
                                                                                                                                                                                               Region
                                                                                                                                                                                                                                        Region
```

ð 셤

g ò

ò

```
Sequence
                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                        319
                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                            182
       Region
 Op
                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                  ð
                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                           Ω
                                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                          음
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
ö
                  121
                                                             ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                     EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                              YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                421
                                                                                                                                       RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                    NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
           2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                               GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
 Gaps
                                                                                                                                                                                                                                                                                   Surface antigen NhhA; meningococcal disease; meningitis vaccine.
 ö
                                                                                                                                                                                                                                                                      meningitidis H38 surface antigen NhhA polypeptide sequence.
11; Indels
                                                                                                                                                                                        EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                               /note= "Variable region 3"
218..236
/label= C4
/note= "Conserved region 4"
                                                                                                                                                                                                                                                                                                                                                                                                          5
Mismatches
                                                                                                                                                                                                                                                                                                                                "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                /label= V2
/note= "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                 'note= "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                   'note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                   /label= C3
/note= "Conserved region
                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                    ¥.
                                                                                                                                                                                                                                                                                                Weisseria meningitidis strain H38
                                                                                                                                                                                                                                   AAU06176 standard; Protein; 599
5;
                                                                                                                                                                                                                                                                                                                                  51..105
/label- v1
                                                                                                                                                                                                                                                                                                                                                              /label- C2
                                                                                                                                                                                                                                                                                                                                                                                                                     /label= V3
                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                        /label= Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label = V4
Conservative
                                                                                                                                                                                                                                                                                                                                                        .117
                                                                                                                                                                                                                                                                                                                                                                                            ..195
                                                                                                                                                                                                                                                                                                                                                                                                                .217
                                                                                                                                                                                                                                                                                                                                                                                                                                                     243
                                                                                                                                                                                                                                                                                                                                                                          118..131
                                                                                                                                                                                                                                                           24-OCT-2001
445;
                                                                                                                                                                                        422
                                                                                                                                                                                                                                               AAU06176;
                                    62
                                                             122
                                                                         259
                                                                                      182
                                                                                                  319
                                                                                                                                      302
                                                                                                                                                  439
                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                             Key
Region
                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
Matches
                                                                                                                                                                                                                      RESULT 9
AAU06176
                       셤
                                    ò
                                               g
                                                             à
                                                                       셤
                                                                                     õ
                                                                                                셤
                                                                                                              ò
                                                                                                                       g
                                                                                                                                     ò
                                                                                                                                                 8
                                                                                                                                                              ò
                                                                                                                                                                         g
                                                                                                                                                                                        ò
                                                                                                                                                                                                                                   셤
```

```
258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present invention relates to the isolation of novel Neisseria menigitidis mutant polypeptides of the surface antigen NhA (AA006182-AA006186). The modified or mutant NhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H38 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 259 ADTKTTTVNVESKDNGKRTEVXIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 2260; DB 22;
Pred. No. 5.6e-134;
; Mismatches 11;
                                                                                    5
/note= "Variable region
                       244..599
/label= C5
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .,
.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 96.2%;
Best Local Similarity 96.5%;
Matches 445; Conservative
                                                                                                                                                                                                                                                                                                           25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                       25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                  (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                          Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2001-488774/53.
N-PSDB; AAS09166.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         599 AA;
                                                                                                                                           40200155182-A1.
                                                                                                                                                                                                  32-AUG-2001
```

ó

```
493
                                                                                                                                                                                   421
                                                                                                                                                                                                                       553
                                                                                                          361
314 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVK
                                                                                                            RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                             242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                         GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N. meningitidis BZ198 surface antigen NhhA polypeptide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                           EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                             /note-
117..126
/label- V2
/~^te- "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C4
/note= "Conserved region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C2
/note= "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Conserved region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= V3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= V4
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis strain BZ198.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                         AAU06179 standard; Protein; 594 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    127..190
/label= C3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ...50
'label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       'label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               'label= C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          . 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 113..231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note=
339..59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-AUG-2001
                                                                                                            302
                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                       194
                                                                                                                                                                                                                                                                                              554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                        AAU06179
                                                                                                                                                                                                                                                                                                                                                                                                                                A CONTRACTOR OF A CONTRACTOR O
                                      ò
                                                                        g
                                                                                                          οy
                                                                                                                                             οp
                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                           δλ
                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
   GDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRG 558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to used to use to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis surface proteins useful for treating N. meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 594;
                                                                                                                                                                                                                                                                                                                 Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                        EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                         DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 2247; DB 20;
Pred. No. 3.6e-133;
2; Mismatches 15;
                                                                                                                                                                                                                                                                                A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 1; Page 95-97; 132pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak IRA;
                                                                                                                                                                  AAY23739 standard; Protein; 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     95.6%;
96.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98WO-AU01031.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                        08-SEP-1999 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local Similarity 96.3
Matches 444; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 1999-418754/35.
N-PSDB; AAX85791.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                             W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                               24-JUN-1999
   499
                                                                                                                                                                                                        AAY23739;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                        559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        194
                                      422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                 RESULT 10
                                                                                                                                                    AAY23739
   g
                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                      ö
                                                                          g
```

```
Peptide
                                                                                                                Protein
                                                                                Key
  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVK 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                        NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                       meningitidis mutant polypeptides of the surface antigen Nhh.
AAU06182-AAU06186). The modified or mutant NhhA polypeptides are
characterised by deletions of non-conserved amino acids, particularly
the deletion of variable regions. The deletion mutants are useful in
diagnostics, therapeutic and prophylactic vaccines against a broader
spectrum of N. meningitidis, and in designing and/or screening of
medicaments. The mutant proteins when used as a vaccine can effectively
immunise against a broader spectrum of N. meningitidis strains than
would be expected from a corresponding wild-type surface antigen.
The present sequence representing the wild type surface antigen NhhA
from N. meningitidis strain B1398 is 1 of 10 NhA polypeptide sequences
(AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVIDAVNKAGWRMKTTTANGOTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                            NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                          DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                      Gaps
                                                          or
                                           New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                               present invention relates to the isolation of novel Neisseria
                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                             Length 594;
                                                                                                                                                                                                                                                                                                                                     15; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                95.6%; Score 2247; DB 22; 96.3%; Pred. No. 3.6e-133;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N. meningitidis PMC21 NhhA deletion mutant #1.
                                                                                                                                                                                                                                                                                                                                    2; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAU06182 standard; Protein; 512
                                                                                         Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                    Matches 444; Conservative
                                                                                                                                                                                                                                                                 the present invention.
          2001-488774/53
                                                                                                                                                                                                                                                                                                                         Best Local Similarity
                                                                                                                                                                                                                                                                                      594 AA;
                     N-PSDB; AAS09169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06182;
                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                            194
                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        554
                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BXBXBXB
ð
                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
```

```
112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVM 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh Manuol182-AAU06186). The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
Surface antigen NhhA; meningococcal disease; meningitis vaccine; mutant; mutein.
                                                                                                                                                                                                  1..51
/label= Signal_peptide
52..512
/label= Mature_WhhA_deletion_mutant_#1
/label= Mrure_mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2213.5; DB 22; Lengt
Pred. No. 3.9e-131;
4; Mismatches 16; Indels
                                                                                            Neisseria meningitidis strain PMC21.
                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           antigen NhhA deletion mutant #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 12; Fig 5; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         94.2%;
95.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
Matches 440; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      512 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB; AAS09172
                                                                                                                                                                                                                                                                                                                                                                                                                WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         02-AUG-2001
                                                                                                                          Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
```

```
241
                                                                                         301
                                                                                                                                             RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                  GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This is the Nisseria meningitidis BASB029 amino acid sequence from serogroup B strain ATCC13090. The BASB029 protein is homologous to the Haemophilus influenzae surface fibril (HSF) protein. The invention relates to BASB029 polynucleotide sequences (AAZ39864-Z39865) and polypeptide sequences (AAY57045) and their immunogenic fragments. BASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HSF; diagnosis;
                                      194 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                         ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                            EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                               YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASB029 amino acid sequence from N. meningitidis strain ATCC13090.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASB029; Nisseria meningitidis; surface fibril protein; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                                                       EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                   /note= "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                               AAY57044 standard; Protein; 594 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98GB-0010276.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 2000-053103/04.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Misc-difference 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB; AAZ39864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                   21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                L8-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                         AAY57044;
                                                  254
                                                                            182
                                                                                                     314
                                                                                                                               242
                                                                                                                                                                                   302
                                                                                                                                                                                                          434
                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                            464
                                                                                                                                                                                                                                                                                      422
                                                                                                                                                                                                                                                                                                              554
                           122
                                                                                                                                                                                                                                                                                                                                                       RESULT 14
                                                                                                                                                                                                                                                                                                                                                                   AAY57044
                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                  g
                                                                     ά
                                                                                                 g
                                                                                                                               δý
                                                                                                                                                     8
                                                                                                                                                                                ò
                                                                                                                                                                                                        g
                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 352
                                                                            421
                                                                                         NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                      RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                            GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 20; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                             surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                              EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2213; DB 20;
Pred. No. 5e-131;
5; Mismatches 18;
                                                                                                                                                                                                                                                                                                  A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 1; Page 100-101; 132pp; English.
                                                                                                                                                                                                                         Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peak IRA;
                                                                                                                                                                                                                      AAY23740 standard; Protein; 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94.2%;
95.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97GB-0026398
                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INNOVATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (ISIS-) ISIS INNOVATION (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                         immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 1999-418754/35.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
hes 438; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594 AA;
                                                                                                                                                                                                                                                                                                                            Surface protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB; AAX85792
                                                                                                                                                                                                                                                                                                                                                                                                                                              14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                          W09931132-A1
                                                                                                                                                                                                                                                                        08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                    24 - JUN-1999
                         302
                                                  353
                                                                            362
                                                                                                     412
                                                                                                                               422
                                                                                                                                                      472
                                                                                                                                                                                                                                                AAY23740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Loca
Matches
                                                                                                                                                                                                        AAY23740
                                                                                                                                                                                                                                    q
                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                         ò
                                                  a
                                                                          ò
                                                                                                                                                      셤
```

```
polynucleotides and polypeptides are useful for generating an immune tresponse in an animal. A therapeutic composition comprising an antibody directed against BASBO29 is useful in treating humans with Nelsseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASBO29 polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial arguer recombinant protein is useful for the stimulation of the immune system of an organism
                                                                                                                                                                                                                                                                   ö
                                                                                                                                                                                                                                                                                                                                                                                                                               EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                      YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                            DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                        NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N. meningitidis EG327 surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                       Length 594;
                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 2213; DB 21;
Pred. No. 5e-131;
5; Mismatches 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1..50
/label= C1
/note= "Conserved region 1"
51..104
/label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis strain EG327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ŕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             594
                                                                                                                                                                                                                                    94.2%;
95.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAU06174 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                             receiving the protein.
                                                                                                                                                                                                                                                   al Similarity
438; Conserv
                                                                                                                                                                                                          594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-OCT-2001
                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06174;
                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                                                  194
                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                           254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   554
                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                    Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU0617
    g
                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                  엄
                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAN061862-AAN06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains then would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain EG327 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2213; DB 2
Pred. No. 5e-131;
5; Mismatches 1
                                                                                                                                                                                                                                                                           /note= "Conserved region 5"
                                     5
                                                                                                                3
                                                                                                                                                        <u>.</u>
"Variable region 1"
                                                                                                                                                                                /label= C4
/note= "Conserved region
                                      region
                                                                                                                   region
                                                                                                                                          /label= V3
/note= "Variable region
                                                                                                                                                                                                                   //abel= V4
/note= "Variable region
                                                             /label= v2
/note= "Variable region
                                                                           /note-
127..190
/label= C3
---= "Conserved r
                        /label= C2
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94.2%;
95.0%;
                                                                                                                                                                                                                                                                                                                                                         25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                   25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity 95.03
Matches 438; Conservative
                                                                                                                                                                                                            .238
                                                                                                                                                                                                                                                  . 594
                                                  .126
                                                                                                                                                                    .231
            .116
                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                                                             (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                       Peak IRA, Jennings MP;
 'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the present invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAS09164.
                                                                                                                                                                                                                                                                                                      WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                  Region
                                                    Region
                                                                                                                               Region
             teg ton
                                                                                         Region
                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δλ
 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

A 34 RNGKNIDIATSMITQUESVSLGAGADAPILESVDEGALNVOSKDANKTURVARVEN E 301 434 RNGKNIDIATSMITQUESVSLGAGADAPILESVDDEGALNVGSKDANKPVRIINNVAPGVKE 301 362 GDVINVAQLKGVAQNILNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
361 493 421
301 433
241 373
313
181

Search completed: October 6, 2003, 09:22:42 Job time: 40.6746 secs

Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli

6, 1 6, 1 15, 1 26,

Sequence Sequence Sequence Sequence Sequence Sequence Sequence

44,

Sequence Sequence Sequence Sequence Sequence Sequence Sequence

Sequence Sequence Sequence

```
242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADTKTTTVNVESKDNGKKTEVK1GAKTSV1KEKDGKLVTGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2337; DB 3;
Pred. No. 2.7e-178;
0; Mismatches 1;
US-08-685-467-4
US-08-409-995-2
US-09-877-155-32
US-09-377-155-32
US-09-268-347-44
US-09-268-347-44
US-08-409-995-5
US-08-913-942-5
US-08-913-942-5
US-08-913-942-5
US-08-913-942-6
US-08-913-942-6
US-08-913-942-6
US-08-913-942-16
US-09-268-347-36
                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 17, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: BEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MONON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: CT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; ORGANISM: Neisseria meningitidis
US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 99.4
Best Local Similarity 99.8
Matches 460; Conservative
   1912
1098
1098
1098
1098
658
658
658
607
                                                                                                                                                                                                                                                                                                                                                                                                 US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQ ID NO 17
LENGTH: 592
   855
849.5
849.5
849.5
849.5
846.5
846.5
846.5
767.5
767.5
613
613
613
613
613
613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE:
     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   , Appl
, Appli
Appli
, Appl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Appl
Appl
Appli
Appli
Appli
Appli
Appli
Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Appl
Appl
Appli
Appli
Appli
                                                                                                                                   alignments)
Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1. No. is the number of results predicted by chance to have a
re greater than or equal to the score of the result being printed,
is derived by analysis of the total score distribution.
                                                                                                               ; Search time 12.3548 Seconds (without alignments)
1582.188 Million cell updates,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                  .....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /cgn2_6/ptodata/1/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/1/iaa/6A_COMB.pep:*
/cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/1/iaa/PcTUS_COMB.pep:*
                  5.1.6
Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -09-669-974-13
-09-377-155-15
-09-669-974-15
-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-268-347-36
US-09-268-347-47
US-09-268-347-32
US-08-409-995-4
                                                                                                                                                                                                                                                                                                                              fotal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -09-377-155-11
-09-377-155-21
-09-669-974-11
-09-669-974-21
-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-669-974-17

US-09-377-155-5

US-09-669-974-13

US-09-974-13

US-09-977-155-15

US-09-977-155-15

US-09-977-155-15

US-09-977-155-15

US-09-977-155-17

US-09-669-974-17

US-09-669-974-11

US-09-977-155-17

US-09-974-11

                                                                                                                                                                                                                                                                                                328717 seqs, 42310858 residues
                    GenCore version Copyright (c) 1993 - 2003
                                                                                                               2003, 09:14:45;
                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                protein search, using sw model
                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                            US-09-771-382-36
2350
1 TDETGLINVETEKLSFGANG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Issued_Patents_AA:*
                                                                                                                                                                                                                                                                                                                                                               length: 0
length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                 October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Scoring table:
                                                                                                                                                                                                   score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 score and is
                                                                                  protein
                                                                                                                                                                                                                                                                                                                                                                  0B
                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                 Searched:
                                                                                                                                                                                  Title:
Perfect s
                                                                                                                                                                                                                                                                                                                                                                Minimum I
Maximum I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                 Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .
0
                                                                                ĕ
```

ö

Gaps

ö

Length 592; Indels 191 121 251

61

181

311 241 371 301

```
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-377-155-13
                                                                                                                                                                                                                                        598
                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                    TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        498
                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                      251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                       EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                  EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2337; DB 4;
Pred. No. 2.7e-178;
0; Mismatches 1;
                                                                                                                                                JOS-09-009-974-17, Application US/09669974
Patent No. 6333173
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, MICHAEL
CURRENT: JENNINGS, MICHAEL
PRIOR APPLICATION UNMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-13
PRIOR FILING DATE: 1997-12-13
SOFTWARE: PATENTIN OFF: 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                         99.4%;
ilarity 99.8%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                         ; ORGANISM: Ne.
US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 460;
                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 592
 432
                                                                                                                                                                                                                                                                                                                                                                    SEQ ID NO 17
                                                                      422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              552
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
 g
                                              엄
                                                                                            g
                       à
                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    318 EVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 2261; DB 3;
Pred. No. 3.1e-172;
4; Mismatches 12;
                                                                                   APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PALENTIN VEY: 2.0
SEQ ID NO S: SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 13, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILLE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
US-09-377-155-5; Sequence 5, Application US/09377155; Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; ORGANISM: Neisseria meningitidis
US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96.2%;
96.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 96.2
Best Local Similarity 96.5
Matches 445; Conservative
```

 \sim

ö

Gaps

;

257

241

361

us-09-771-382-36.rai

```
318 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                    122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                            2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 61
                                                                                                                                                                                                                   EVIDAVNKAGWRMKTTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDFTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 598;
                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             422 EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2261; DB 4;
Pred. No. 3.1e-172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2261; DB 4;
Pred. No. 3.1e-172;
                                                                                         4; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INCORNATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR PILING DATE: 1990-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR PILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN Ver: 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; Sequence 13, Application US/09669974
; Patent No. 6333173
     , ORGANISM: Neisseria meningitidis
US-09-669-974-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Neisseria meningitidis US-09-669-974-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96.2%;
                                                       96.2%;
96.5%;
                                                                                         Matches 445; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       446;
                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local (
                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pp
                                                                                                                                                             qq
                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                            δλ
                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                      ó;
                                                                                                                                                                                                                                                                                                                        EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                 122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                 Length 598;
                                                                                                                                                                                                                                                                      12; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EAGYAIGYSSISDTGNWVIKGTASGNSRGHFGASASVGYQW 598
                                                                                                                                                                                                                                Score 2261; DB 3;
Pred. No. 3.1e-172;
                                                                                                                                                                                                                                                                    3; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-69-974-5

Sequence 5, Application US/0966974

Sequence 5, Application US/0966974

Sequence 5, Application US/0966974

Sequence 5, Application US/0966974

SEQUENCAL INCOMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PININICAL MICHARD PAUL
APPLICANT: MOXON, E. Richard Paul
APPLICANT: MOXON, E. Richard Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
CURRENT APPLICATION NUMBER: US/0569,974
CURRENT FILING DATE: 1999-08-19

PRIOR FILING DATE: 1999-08-19

PRIOR FILING DATE: 1998-12-14

PRIOR FILING DATE: 1998-12-14

PRIOR FILING DATE: 1998-12-12

NUMBER OF SEQ ID NOS: 33

SOFTWARE: PATENTIN VET: 2.0

SEQ ID NO 5

LENGTH: 598
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFWARE: Patentin Ver. 2.0
                      PCT/AU98/01031
                                                                                                                                                          TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                 96.2%;
96.7%;
                                                                                                                                                                                                                                                                    Matches 446; Conservative
                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                              US-09-377-155-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: PRT
                                                                                                                                                                                                                                                      Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
```

ö

Gaps

.<u>`</u>

QY 242 YDVNVGDALNVNQLQNSGMNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301 Db 379 YDVNVGDALNVNQLQNSGMNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNIEIT 438 QY 302 RNGKNIDIATSMTPQESSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361 Db 439 RNGKNIDIATSMTPQESSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 498 QY 362 GDVTNVAQLKGVAQNLANRIDNVNGNARAGIAQAIATAGLVQAVLPGKSMMAIGGGTYLG 421 Db 499 GDVTNVAQLKGVAQNLANRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRG 558 QY 422 EAGYALGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462 Db 559 EAGYALGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 599	RESULT 8 US-09-669-974-15 Sequence 15, Application US/09669974 Patent No. 6333173 GENERAL INFORMATION: APPLICANT: PERK, Ian Richard Anselm APPLICANT: DENK, Michael Paul APPLICANT: DENK, Michael Paul APPLICANT: DENK, Michael Paul APPLICANT: DENK, MICHARD TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REPERENCE: 05064/0128 CURRENT APPLICATION NUMBER: US/09/669,974 CURRENT FILING DATE: 1999-08-19 PRIOR FILING DATE: 1999-08-19 PRIOR PILING DATE: 1999-08-19 PRIOR PELICATION NUMBER: GB 9726398.2 SOFTWARE PATENTIN Ver. 2.0 SEQ ID NO 15 LENGTH: 599 TYPE: PRT CORGANISM: Neisseria meningitidis	Query Match 96.2%; Score 2260; DB 4; Length 599; Best Local Similarity 96.5%; Pred. No. 3.8e-172; Matches 445; Conservative 5; Mismatches 11; Indels 0; Gaps 0; Qy 2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTVHLNGIGSTLTDMLL 61 Db 139 DLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLL 198 Qy 62 NTGATTNVTNDNVTDBEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTEL 198 Qy 62 NTGATTNVTNDNVTDBEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTEELS 121	Db
Qy 62 NTGATTINVTNDIVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVBFTS 121 111111111111111111111111111111111111	Qy 302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361	PRIOR FILLING DATE: 1998-12-19 PRIOR APPLICATION NUMBER: GB PRIOR FILLING DATE: 1997-12-11 NUMBER OF SEQ ID NOS: 33 SOFTWARE: Patentin Ver. 2.0 SEQ ID NO 15 LENGTH: 599 TYPE: PRT ORGANISM: Neisseria meningiti	Query Match 96.2%; Score 2260; DB 3; Length 599; Best Local Similarity 96.5%; Pred. No. 3.8e-172; Matches 445; Conservative 5; Mismatches 11; Indels 0; Gaps 0; QY 2 DETGLINVETERESCRANGKVNITSDTKGLNFARETAGTNGDTTVHLNGIGSTLTDMLL 19 Db 139 DLTDLTSVETEKLSFGANGKVNITSDTKGLNFARETAGTNGDTTVHLNGIGSTLTDMLL 198 QY 62 NTGATTNVTNDNVTDDEKKRAASVKDVLNGWNIKGVKFGTTASDNVDFVRTYDTVFFLS 121 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

```
ŏ
                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                      ó
NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                             DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLFDMLL
                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                 Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                      15; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              559 EAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 599
                                  EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                               Score 2247; DB 3;
Pred. No. 4.1e-171;
2; Mismatches 15;
                                                                                                             Sequence 7. Application US/09371155
Patent No. 6197312
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL, SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR PILING DATE: 1999-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
RICHARD FILING DATE: 1998-12-12
SROID NOTE: SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 7, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                              tch 95.6%;
al Similarity 96.3%;
444; Conservative
                                                                                           RESULT 9
US-09-377-155-7
                                                                                                                                                                                                                                                                                                                     LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                      US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -09-669-974-7
           499 (
                                  422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242
                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              422
                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 10
           g
                                 ŏ
                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Dp
                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
```

```
253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 2247; DB 4;
Pred. No. 4.1e-171;
2; Mismatches 15;
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: WOXON, E. Richard
ITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CORRENT APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
APPLICANT: PERK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFRENCE: 06504/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 9, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Neisseria meningitidis
US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 95.6%;
Best Local Similarity 96.3%;
Matches 444; Conservative 2
                                                                                                                                                                                                                                                                                                                                                                                   594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          554
                                                                                                                                                                                                                                                                                                                                                             SEQ ID NO 7
```

ö

Length 594;

```
US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-377-155-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQ ID NO 11
Query Match
Best Local S:
Matches 438
                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                   314
                                                                                                                                                                                                                                                                              242
                                                                                                                                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                                                                                                                               434
                                                                                                                                                                                                                                                                                                                                                                                                                     464
                                                                                                                                                                                                                                                                                                                                                                                                                                                 422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: PRT
                                                                                q
                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Op
                                                                                                             δλ
                                                                                                                                     qq
                                                                                                                                                                 QΥ
                                                                                                                                                                                         g
                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                              δŏ
                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                          Óχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δy
                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                               NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                     242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                  RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                             2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 61
                                                                                                                                                                  Gaps
                                                                                                                                                                    .;
0
                                                                                                                                        Length 594;
                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18;
                                                                                                                                    Score 2213; DB 3;
Pred. No. 2.1e-168;
5; Mismatches 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INCORNATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
TITLE OF INVENTION: NOVEL SURPACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US/09/609,01031
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-13
SOFTWARE: PATENTING DATE: 1998-12-14
SPRIOR FILING DATE: 1998-12-12
9726398.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 9, Application US/09669974
Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; ORGANISM: Neisseria meningitidis US-09-669-974-9
                                                                                              ORGANISM: Neisseria meningitidis
                                                                                                                                       94.2%;
95.0%;
            1997-12-12
 ВB
                         NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 9
                                                                                                                                                    Best Local Similarity 95.0
Matches 438; Conservative
 PRIOR APPLICATION NUMBER:
PRIOR FILING DATE: 1997-1
                                                                     594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-669-974-9
                                                                                                           US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    422
                                                                                                                                                                                                                                                                                                                                                                                       314
                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                        122
                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              554
                                                                                  TYPE: PRT
                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ID NO 9
                                                                     LENGTH
                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                   рp
                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qq
                                                                                                                                                                                               ð
                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                    ά
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
```

```
ö
                                                                                                                                                           191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                            EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                          ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                        YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                             DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17;
Score 2213; DB 4;
Pred. No. 2.1e-168;
5; Mismatches 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match

94.1%; Score 2210.5; DB 3
Best Local Similarity 95.4%; Pred. No. 3.3e-168;
Matches 440; Conservative 3; Mismatches 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DEAK, Ian Richael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; Sequence 11, Application US/09377155; Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM: Neisseria meningitidis
  94.2%;
95.0%;
                                         Conservative
                       al Similarity
438; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Db
```

a

551 EAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591

Search completed: October 6, 2003, 09:35:58 Job time: 14.3548 secs

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

October 6, 2003, 09:13:35 ; search time 13.2249 Seconds (without alignments) 3359.577 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-09-771-382-36 2350 1 TDETGLINVETEKLSFGANG......TASGNSRGHFGASASVGYQW 462

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

283308 seqs, 96168682 residues

Searched:

283308 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR_76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	adhesin NMB0992 [i	probable surface f	adhesin homolog HI	probable adhesin Z		surface protein XF	surface protein XF	probable autotrans	probable surface p	surface-exposed ou	probable autotrans	probable adhesin h	high-molecular-wei	hypothetical prote	sapB protein - Cam	surface	190K surface antig	ABC-type transport	outer membrane pro	probable RTX famil	hypothetical prote	surface-array prot	hypothetical prote	high-molecular-wei	hypothetical prote	S-layer protein -	adhesin/invasin, p	hypothetical prote	filamentous hemagg
SUMMARIES	ID	G81133	A81888	164138	A86036	H91188	D82671	A82615	AC0976	AH0110	C82672	AD0123	AF0394	A43855	T31105	140711	AB3486	A41477	C48399	JC1340	B85547	F90696	A56143	B98047	B43855	E97835	T03415	A81019	876109	T31102
	DB	7	7	7	7	~	7	7	~	7	7	7	7	7	7	7	7	7	7	7	~	~	7	7	7	7	7	~	7	7
	Query Match Length	591	592	298	1588	1588	2059	1190	1107	658	1004	3705	1910	1536	4919	936	365	2249	2020	1651	5188	5291	1109	2551	1477	1655	1361	364	3029	4152
dР	Ouery Match	94.1	90.9	16.6	15.3	15.3	15.3			•		8.8	•	8.3	8.1	8.0	8.0	8.0	8.0	7.9	7.9	7.8	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
	Score	2210.5	2136	390.5	360	360	359.5	357	348.5	317	212.5	207	200.5	195	190	188.5	187.5	187.5	187	186	₹*	183.5	181	181	180.5	180.5	180	179.5	٠	178
	Result No.	٦,	7	æ	4	Ŋ	9	7	&	σ	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	56	27	28	29

hypothetical prote hypothetical prote	surface-array prot hypothetical prote hypothetical prote	hemolysin A precur ice nucleation pro	autorransporter pr flagellin [importe hemagglutinin/hemo	hypothetical prote outer membrane pro probable autotrans	probable lipoprote probable invasin Y conserved hypothet
G64964 A83412	A37284 T33369 F85809	A35140 S11672	AD3203 F90961 B99789	E85649 S07575 AF0351	D81411 AB0480 AF2959
220	777	000	777	0 0 0	000
1091 2468	893 1275 585	1577	1035 585 1268	1270 1300 1430	978 3013 1052
7.5	7.5	4.7.	7.7.	7.3	7.3
177	176.5 175.5 174	173.5	172.5	171.5 171.5 171.5	171 171 170
30	33 34 34	392	38 38 36	4 4 4 2 1 2	43 44 5

ALIGNMENTS

·	RESULT 1 G81133 adhesin NWB0992 C;Species: Neis C;Date: 31 Mar- C;Accession: G8 R;Tettelin, H.; H;CKGY, E.K.; H. ri, H.; Qin, H.; A, Huthors: Grann A, Title: Comple A, Recerence num A, Accession: G8 A, Xotatus: preli A, Wolcoule type A, Residues: 1-5 A, Cross-referenc A, Scherimental C;Genetics A, Genetics C;Genetics	RESULT 1 GB1133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: GB1133 R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000 A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A;Itle: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A;Reterence number: A81000; MUID:20175755; PMID:10710307 A;Accession: GB1133 A;Status: preliminary A;Residues: 1-591 «TET> A;Cross-references: GB:AE002450; GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722 A;Genetics: C;Genetics: A;Gene: NNB0992
	Query Match Best Local Matches 44	Query Match 94.1%; Score 2210.5; DB 2; Length 591; Best Local Similarity 95.4%; Pred. No. 9.3e-110; Matches 440; Conservative 3; Mismatches 17; Indels 1; Gaps 1;
	Qy	2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 61
	Oy Db	62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDEVRTYDTVEFLS 121
	Qy Db	122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLYTGKGKGENGSSTDEGEGLVTAK 181
	Qy	182 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDGGNITVK 241
-	Qy	242 YDVNVGDALNVNQLQNSGWNLDSRAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
C. w.	Qy	302 RNGKNIDIATSMTPOFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
	Qy	362 GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421

Vente

```
probable adhesin 25029 [imported] - Escherichia coli (strain O157:H7, substrain EDL93 C;Species: Escherichia coli C;Date: 16-Feb-2001 #text_change 14-Sep-2001 C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 C;Date: 16-Feb-2001 #text_change 14-Sep-2001 R;Perna, N.T.; Plunkett III, G;Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; May iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apoda Nature 409, 529-533, 2001 A;Reference number: A85480; MUID:21074935; PMID:11206551 Coli O157:H7. A;Reference number: A86036 A;Status: preliminary A;Molecule type: DNA A;Residues: 1-1588 <STO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: GB:AE005174; NID:g12518349; PIDN:AAG58749.1; GSPDB:GN00145; UWGP: A;Experimental source: strain 0157:H7, substrain EDL933 C;Genetics:
Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Ver A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Recession: I64138
A;Recession: I64138
A;Residues: I-298 <IIGR>
A;Residues: I-298 <IIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:91574588; PID:91574589; TIGR:HII732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKYRQIIN-----VADGSEAHDAVT-VROLONAIGAVATTPTKYFHANSTEEDSLAVG 1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----VLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK---- 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         139 KTEVKIGAKTSVIKEK ------DGKLVTGKGKGE------NGSSTDEGE 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              176 GLVTAKEVIDAVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTKVTFASGNGTTA 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           56 LIDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYD 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGK------GKGENG 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               55
                                                                                                                                                                                                                                                                                                                                                                                                                                                        7 INVETEKLS------FGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4 TGLINV---ETEKLSFGANGKKVNII-SDTKGLNFAKETAGTNGDTTVHLNGI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----GSTLTDMLLNTGA-TTNVTNDNV-----TDDEKKRAASVKD-
                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                              23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73; Mismatches 236; Indels 116;
                                                                                                                                                                                                                                                                                                 Length 298;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1588;
                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                 48;
                                                                                                                                                                                                                                                                                                       DB 2;
                                                                                                                                                                                                                                                                                                 16.6%; Score 390.5; DB 2
48.9%; Pred. No. 6.9e-14;
live 24; Mismatches 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15.3%; Score 360; DB 2; 24.9%; Pred. No. 2.2e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity 24.98
Matches 141; Conservative
                                                                                                                                                                                                                                                                                                                                                              91; Conservative
                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S-STDE 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            290 TEDIDE 295
                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Gene: Z5029
                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ολ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                              Z249
                                                                                                                                                                                                                                                                                                                                                                                             S.R.; Morel
Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737989
A;Experimental source: serogroup A, strain 22491
C;Genetics:
A;Gene: NMA1200
                                                                                                                                                                                                                                                probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain 224 Species: Neisseria meningitidis (Species: Nay-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 (Species: Nay-2000 #sequence of Species: Nay-2000 #sequence of Nay-2000 Nature 404, 302-506, 2000 Nature 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 diesin homolog H11732 - Haemophilus influenzae (strain Rd KW20)
C; Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
C;Accession: 164138
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage, Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVT 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AKEVIDAVNRAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDGGNIT 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      310 AKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNIT 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRG 550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTA--SDNVDFVRTYDTVEF 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240 VKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIE 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300 ITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGV 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360 KEGDVINVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTY 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420 LGEAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYOW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                            Score 2136; DB 2;
Pred. No. 8.1e-106;
9; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tch 90.9%; al Similarity 92.2%; 427; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Residues: 1-592 <PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S:
Matches 427,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
   491
                                                                                                                        551
                                                             422
   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
```

Db 1264 QTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSADTDAVNVGQLKVTDAQVSQNTQ 13	1323	Db	1384 AADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATDAVNVAQLKSSEAGGVRYD 1443
	273	QY	328 APTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQN 376
Db 1324 SITNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIA 13	1383	Db	1444 TKADGSIDYSNITLGGGNGG-TTRISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRWVE 1502
QY 274 VISGNVSPSKGKMDETVNINAGNNIELTRNGKNIDIATSWTPQFSSVSLGAGAD 32	327 1443	Qy	377 LNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGG 436
QY 328 APTLSVDDEGALNVGSKDANKPVRITUNVAPGVKEGDVTNVAQLKGVAQN 37	376 1502	Qy Db	437 NWIIKCTASGNSRGHFGASASVGYQW 462 : 1563 RWVXKLQGSTNSQGEYSAALGAGIQW 1588
QY 377 LNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYALGYSSISAGG 43 ::::	436	RESULT D82671	
QY 437 NWIIKGTASGNSRGHFGASASVGYOW 462 		surface C; Spec: C; Date C; Acces	<pre>surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c) Cispecies: Xylella fastidiosa C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000 C;Accession: D82671</pre>
RESULT 5 H91188 proble adhesin ECs4480 [similarity] - Escherichia coli (strain O157:H7, sub C.Species: Escherichia coli	substrain RIMD	K; anony Nature A; Title A; Refer A; Note	Nature 406, 151-157, 2000 A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Title: The genome sequence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717; PMID:10910347 A;Note: for a complete list of authors see reference number A59328 below
C;Date: 18-Jul-2001 #Sequence_revision 18-Jul-2001 #text_change 02-Nov-2001 C;Accession: H91188 R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H.	К.; Han, С.G. Н.	A; Statu A; Molec A; Resic A; Cross	us: prof. Day. us: type: Dna cule type: Dna dues: 1-2059 <sim> s-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:GN</sim>
o, 11-22, 2001 on publete genome sequence of enterohemorrhagic Escherichia coli O157 e number: A99629; MUID:21156231; PMID:11258796 n: H91188	7:H7 and genc	A; Exper R; Simps Briones as-Netc	rimental source: strain 9a5c son, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. s. M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer o, E.; Docena, C.; El-Dorry, H.; Pacincani, A.P.; Ferreira, A.J.S.
A;Status: preliminary A;Wolecule type: DNA A;Residues: 1-1580 <hr/> A;Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN0015 A;Experimental source: strain 0157:H7, substrain RIMD 0509952 C;Genetics: A;Gene: ECs4480	154	submit: A; Autho J.D.; (Chado, A; Autho , F.G., Rodrig:	submitted to GenBank, June 2000 A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins A;Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C. F.G.; Nunnes, L.R.; Oliveira, M.A.; de Goliveira, M.C.; de Soliveira, R.C.; Palmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa
Query Match 15.3%; Score 360; DB 2; Length 1588; Best Local Similarity 24.9%; Pred. No. 2.2e-11; Matches 141; Conservative 73; Mismatches 236; Indels 116; Gaps 1	18;	A; Autho M.; Tsu A; Refel A; Conte	A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silv M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L. A; Reference number: A59328 A.Contents: annotation
QY 4 TGLINVETEKLSFGANGKKVNII-SDTKGLNFAKETAGTNGDTTVHLNGI 52 :	52 1091	A; Gene Quer	15.3%;
GSTLTDMLLNTGA-TTNVTNDNVTDDEKKRAASVKD-	87	Best_Loc Matches	Similarity 24.5%; Pred. No. 3.3e-11; 1; Conservative 82; Mismatches 188;
SSRVIAKGSRDTSITENGVVIGYDTTDGELLGALSIGDD ASDNVDFVRTYDTVEFI,SADTKTTTVNVESKDNGK	1151	Qy Dh	8 NVETEKLSFGANGKKVNISDTKGLNFAKETAGTNGDTTVHLNGIGSTL 56 1 :
1152 GKYRQIINVADGSEAHDAVT-VRQLQNAIGAVATTPTKYFHANSTEEDSLAVG	1203	ão No	
Qy 139 KTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGE 17 D :	175 1263	qa o	
	228	qq	
1264 QINYTAYNMDAPQNSVGEFSVGSADGÖRQITNVAAGSADTDAVNVGQLKVTDAQVSQNTQ 1	1323	Qy	129 VNVESKDNGKKTEVKLGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLUTAK 181
QY 229 TVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK 273 ::: ::		Oy Oy	1650 VNTDGVKVGSDVSLGAMGLFIANGPSVTASGFNAGDKVISHVAVGMADTDAVNVSQLK 1707 182 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFAS 222
Qy 274 VISGNVSPSKGKMDETVNINAGNNIELTRNGKNIDIATSMTPQFSSVSLGAGAD 32	327	qa	: : : :

	223 GNGTTATVSKDDQGNITVKXDVNVG247		154 KDGKLVTGKGKGENG-SSTDEGEGIVTAKEVIDAVNKAGWRMKTTTANGOTGQADKFETV 212
RESULT A82615 Surface C; Spece C; Spece C; Date C; Date C; Date A; Fittl A; Fittl A; Fittl A; Refel A; Rober Briones as-Net Briones as-Net A; Auth A; Auth A; Auth A; Auth A; Auth A; Auth A; Tsp C; Genet A; Gene	RESULT 7 A02DLT 6 Conceres: Avg. 1200 Avg.	RESULT 8 AC0076 AC0076 Probable C; Specie C; Specie C; Access R; Parkhi th, T.; th, T.	1150 1 autot 1 e autot 1 i chis 2 i chis 3 sals 1 chis 4 chis 4 chis 4 chis 4 chis 1 chis 4 chis 1 chis 2 chis 3 chis 4 chis 4 chis 4 chis 4 chis 4 chis 5 chis 6 chis 6 chis 1 chis

0092)	0y 290 VMINAGNNI-EITRNGKNIDIAFSWTPQFSSVSLGAGADAPTLS
N. Thomson, N. T. Titball, R. W.; Holden, M. T. G.; Prentice, M. B. The continual to the control of the contro	Kindhoson, A.J.S.; Bueno, M.R.P.; Canargo, A.J.; Camargo, L.B.A.; Carraro, D.M.; Carraro, S. S.; Bueno, M.R.S.; Bueno, M.R.P.; Camargo, A.J.; Camargo, L.B.A.; Carraro, D.M.; Carraro, Submitted to Genbank, June 2000 as.Neto, E.; Docean, C.; E. L'Dorry, H.; Facincan, A.S.; Franco, M.C.; Martino, C.L.; Martino, C.L.; Martino, C.L.; Martino, C.L.; Martino, C.L.; Martino, C.L.; Martino, M.C.; Martino, M.C.; Martino, M.C.; Martino, C.L.; Martino, M.C.; Martino, M.C.; Martino, M.C.; Martino, M.C.; Martino, C.L.; Martino, C.L.; Martino, C.L.; Martino, M.C.; Martino, C.C.; Martino, M.C.; M.C.; Martino,

qq	377 KSQLDGVTASVNDVVASVKNIAGAIQITGSGVASVSGQDSTAAGASAQAAGDSSIA 432	qq	2664 TDDAEVTLTSSNGVSNAVTIDIADA-TLNLDDIALFNHALTGNGLLNVAKNDASTAFDFG 2722
٥٧	246 VGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI 298	οχ	354 NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKS 410
qq	: : :	Db	2723 ATVGGAFTGTVNLNNSTFDLSGNNTTVLAQATLKLSSGNLTSVGNG 2768
Oy Db	299 EITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD-ANKPVRITNV 355 :	Qy Db	411 MMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNSR 449 :
Qy Db	356 APGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYL 406 	RESULT AF0394	12
δ D	4 6	probabl C;Speci C;Date:	probable adhesin hmwA [imported] - Yersinia pestis (strain CO92) C:Species: Yersinia pestis C:Species: O2.Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001
oy d	•	R; Parkl deno-Te	R.Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G dil, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrel
RESULT	11	A; Title A; Refer A; Acces	A;Title: Genome sequence of Yersinia pestis, the causative agent of plague. A;Reference number: AB0001; MUID:21470413; PMID:11586360 A;Accession: AF0394
AD0123 probab	AD0123 problem autotransporter protein yapH [imported] - Yersinia pestis (strain C092) - Snaciae: Varsinia nastis	A; Statu A; Molec	Is: preliminary lice type: DNA lice type: DNA
C; Date	C;Date: 02.Nov-2001 #sequence_revision 02.Nov-2001 #text_change 02.Nov-2001 C;Accession: AD0123	A; Cross C; Genet	references: GB:AL590842; PIDN:CAC92482.1; PID:915981183; GSPDB:GN00175
R; Parl deno-1	chill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. Parraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.;	A;Gene:	hmwA
il, M Nature A;Tit]	Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrell, 413, 523-527, 2001 e. Genome sequence of Yershia pestis, the causative agent of plague.	Query Best Match	Query Match 8.5%; Score 200.5; DB 2; Length 1910; Best Local Similarity 21.9%; Pred. No. 0.0077; Matches 124; Conservative 71; Mismatches 191; Indels 179; Gaps 27;
A; Kell A; Acco A; Stat A; Mole	A; Relefence number: Abuuul; MulD:214/0413; PMID:11586360 A; Accession: AD0123 A; Status: preliminary A; Molecule type: DNA	Qy Db	6 LINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGD 44 7 1.1
A; Res A; Cro C; Gen A; Gen	A;Residues: 1-3705 <kur> A;Cross-references: GB:AL590842; PIDN:CAC89847.1; PID:g15979073; GSPDB:GN00175 C;Genetics: A;Gene: yapH</kur>	Qy Db	45 TTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKP 100
Que: Best Matc	Query Match 8.8%; Score 207; DB 2; Length 3705; Best Local Similarity 24.4%; Pred. No. 0.0079; Matches 129; Conservative 61; Mismatches 189; Indels 150; Gans 27.	Qy du	101 GTTASDNVDFVRTYDT-VEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG 156 : :::
ολ	FGANGKKVNIISD-TKGLNFAKETAGTNGDTTVHLNGIGSTL 5	δδ	KLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGGTGQADKFETV
QQ		qq	NATLNGSSSSGKGVEIT
Oy Db	57 TDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTY 114	oy D	213 TSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNV
oy Dp	115 DTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEG 174	Qy Db	253KQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 286 1500 TGIKLNGNNDLSNTSLNSSAVDGIALDITGPLANQGNVILNGTASGSGIGAQVNGSLS 1557
Oy Dp	175 EGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 209 19	Qy	287 DETVNINACNNIEITRN
Qy Dp	210 ETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAG 269	QY	310 ATSMTPQFSSVSLGAGADAPTLSVDDEGALAVGSKDANKPVRITHVAPGVKEGDVTNVAQ 369 :::
oy Dp	270 SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAG 325	Qy	370 LKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAI 427
ò	326ADAPTLSVDDEGALNVGSKDANKPVRIT 353	Qy	428 GYSSISAGGNWIIKGTASGNSRGHF 452 : :

```
R;Dworkin, J.; Tummuru, M.K.; Blaser, M.J.
J. Biol. Chem. 270, 15093-15101, 1995
A;Title: Segmental conservation of sapA sequences in type B Campylobacter fetus cells A;Reference number: A56999; MUID:95318069; PMID:7797493
A;Accession: I40711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Molecule type: DNA
A;Residues: 1.4919 <WAR>
A;Cross-references: EMBL:AF057696; NID:g3929021; PID:g3929023; PIDN:AAC79761.1
C;Genetics:
A;Gene: 1spA2
                                                                                                                                                                                                                                  29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----SFGVLNITSTGNVSNNGTLISNERLNITSAANFTNESNGTVMSNGLLNIIAKQ 972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362 GDVINVAQLKGVAQ-NLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYL 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421 GEAGYAIGYSSISAGGNWIIK-----GTAS-----GNSRGHFGAS 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                .---- 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGK------GENGSSTDEGEGLV 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---VSPSKGKMDETVN---INAGNNIEITRNGK--NIDIATSM 313
                                                                                                                                                                                                                                                                                                                      515 LINLINISELS - ANNLTLINTSINITLKINKSKFTAGIMTLINVTNINVTLINI-DSELAANNLTL 571
                                                                                                                                                                                                                                                                                                                                                                                                TAKEVIDAVNKAGWRMKTTTANGQTGQADKFE---TVTSGTKVTFA-SGNGTTA-TVSKD 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sapB protein - Campylobacter fetus
C;Species: Campylobacter fetus
C;Species: Campylobacter fetus
C;Sate: 16-Aug-1996 #sequence_revision 16-Aug-1996 #text_change 08-Oct-1999
C;Accession: 140711
R;Dworkin, J.; Tuumuru, M.K.; Blaser, M.J.
J. Biol. Chem. 270, 15093-15101, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   752 NAQN-----QLKVNVNNFTISQGDDITLIGNVTLNASGTFTNSGNLTTVKTLDVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 314 TPQFSSVSLGAGADAPTLSVDDEGALNVGSK-DANKPVRITNVAPG-----VKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           632 LSLNASHNVTLNNKSKLSAQKADIKAVNLTLNDTTELTAKNLDINSTTITNNGTIAGIFA
                                                                                                                                                                                                                                                                           7 INVETEKLSFGANGKKVNIISDTKGLNFAKETAGT -- - NGDTTVHLNGIGSTLTDMLLNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-936 <RES-
A;Cross-references: EMBL:U25133; NID:9801999; PIDN:AAA79683.1; PID:9802000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DQGNITVKYDVNVGDALNV---NQLQNSG------WNLDSKAVAGSSGKVI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                --LNAGWNIKGVKPGTTASDNVDF----VRTYDTVEFL--SADTKTTTV----
                                                                                                                                                                                                                                  Indels 188;
                                                                                                                                                                                                                                                                                                                                                                      GATTNVT------VKDV------VKDV---
                                                                                                                                                                                     2; Length 4919;
                                                                                                                                                                                   ; Score 190; DB 2; L; Pred. No. 0.089; 68; Mismatches 213;
                          A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                     8.18; 22.58;
                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1078 GSSGY 1082
                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 136; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ASVGY 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -SGN----
    A; Accession: T31105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 15
                                                                                                                                                                                                                                                                                å
                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dp
                                                                                                                                C; Species: Haemophilus influenzae
C;Date: 10-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 08-Oct-1999
C;Accession: A4385
R;Barenkamp, S.J.; Leininger, E.
Infect. Immun. 60, 1302-1313, 1992
A;Title: Cloning, expression, and DNA sequence analysis of genes encoding nontypeable
                                                                                                                                                                                                                                                                                                                 A;Accession: A43855
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1536 <BAR>
A;Residues: 1-1536 <BAR>
A;Cross-references: GB:MB4616; NID:g475770; PIDN:AAA20527.1; PID:g475771
A;Note: sequence inconsistent with the nucleotide translation
A;Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical protein 2 - Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Species: Haemophilus ducreyi
C;Date: 22-Oct-1999 #sequence_revision 22-Oct-1999 #text_change 22-Oct-1999
C;Accession: T31105
R;Ward, C.K.; Lumbley, S.R.; Latimer, J.L.; Cope, L.D.; Hansen, E.J.
A;Ward, C.K.; Lumbley, S.R.; Latimer, J.L.; Cope, L.D.; Hansen, E.J.
A;Title: Haemophilus ducreyi secretes a filamentous hemagglutinin-like protein.
A;Reference number: 220984; MUID:99030326; PMID:9811662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      965 ITNKNGDLNITNE--GSDTEMQIGGDVS---QKEGNLTISSDKINITKQITIKAGVDGEN 1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ESSSGSVTLTATEGALAVSNISGN-----TVTVTANSGALTTLAGSTIKGTESVTTSSQ 1229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1020 SDSDATNNANLTIKTKELKLTQDLNISGFNKAEITAKDGSDLTIGNTNSADG----TNAK 1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGDIGGTISGGTVEVKATESLTT----OSNSKIKATT--GEANVT----SATGT--I 1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NVTLIGSDFDNHQKPLTIKKDVI-INSGNLTAGGNIVNIAGNLTVESNANFKAITNFTFN 916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     217 KVTF-----ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAV 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWII 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           917 VGGLFDNKGNSNIS--IAKGGARFKDIDNS-----KNLSITTNSSS-----TYRTIISGN 964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GADAPTLSVD-DEGALNVGSKDANKPVRITNVAPGVKEGDVTNVA--QLKGV-AQNLNNR 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGAT-TNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGK ------GEN 167
                                                                                                             high-molecular-weight surface-exposed protein HMW1 - Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KVTFNOVKDSKISADGHKVTLHSKVETSGS-----NNNTEDSSD----NNAGLTIDAKNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268 AGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIAT---SMTPQFSSVSLGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NVETEKLSFGANGKKVNIISDTKGLNFAKETAGTN-----GDTTVHLNGIGSTLTDMLLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSSTDEGEGLVTAK----EVIDAVNKAGWRMKTTTAN-----GQTGQADKFETVTSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68; Mismatches 191; Indels 110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1536;
                                                                                                                                                                                                                                                                                              A; Reference number: A43855; MUID: 92192797; PMID: 1548058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .;
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 195; DB 2
Pred. No. 0.011;
HINGAISGGE--ING-HSDNSHGVF 1740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity 24.4
Matches 119; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          || |||:
|GGTISGNT 1282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KGTASGNS 448
                                                                                                                                                                                                                                                                      detella pertussis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1230
1719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 14
ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
```

25;

A;Gene: sapB

```
99 KPGTTASDNVDF-----VRTYDTVEFLSADTKTTTVNVESKD-----NGKKTEVKIGA-- 146
                                                                                                                                                                                                                                                                                                                                                                                                     248 DALNVNQLQNSGWNL---DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR-- 302
                                                                                                                                                                                                                                                                                                                                                                                                                            661 RGSVKLITVKLNDVTGANDVVKIVLDAAAKDASIALGTEATDKALVIDTGTETLNITSLV 720
                                                                                                                                                       199 AN-----GOTGQADKF--ETVTSGTKVTFASGNGTTATVSK--DDQGNITVKYDVNVG 247
                                                                                                                                                                                                                                                                                                                                                         303 ------NGKN--IDIATSMTPQFSSVSLGAGADAPTLSVDDE-GALNVGS-K 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              147 ---KTSVIKEK--DGKLVTGKGKGENGSSTDEGEG---LVTAKEVIDAVNKAGWRMKTTT 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       345 DANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQA 404
                                                                  1 TDETGLINVETEK--LSFGANGK-KVNII------SDTKGLNFAKET---AGTNG 43
                                                                                                                                    44 DTTVHLNGIGSTLTDMLLNTGATTNVTND-----NVTDDEKKRAASVKDVLNAGWNIKGV 98
Query Match 8.0%; Score 188.5; DB 2; Length 936;
Best Local Similarity 22.7%; Pred. No. 0.014;
Matches 119; Conservative 71; Mismatches 225; Indels 109; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        405 YLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGTASGNS 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              : |: :| |: :| 764 KVSMIDARAL-----KAGLTFDASAITLGANATIKGGSGADS 800
                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                   q
                                                                                                                                    ò
                                                                                                                                                                   g
                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                   οŽ
                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                   ö
```

Search completed: October 6, 2003, 09:33:37 Job time : 16.2249 secs

Page 1

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                             OM protein - protein search, using sw model
```

October 6, 2003, 09:06:20 ; Search time 7.13446 Seconds (without alignments) 3045.266 Million cell updates/sec Run on:

US-09-771-382-36 2350 1 TDETGLINVETEKLSFGANG......TASGNSRGHFGASASVGYQW 462 Title: Perfect score: Sequence:

Scoring table:

127863 seqs, 47026705 residues BLOSUM62 Gapop 10.0 , Gapext 0.5

Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries

SwissProt_41:* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

		ď			SUMMARIES		
Result No.	Score	Query Match	Query Match Length	DB	ID	Description	
н	œ	8	2249	-	<u>a</u>	P15921 rickettsia	
7	187	8.0	2003	П	YDBA_ECOLI	_	~
m	180.5	7.7	1655	-	OMPB_RICCN	Q9kka3 r outer mem	_
4	180	7.7	1654	H	OMPB_RICRI	Q53047 r outer mem	_
2	179.5	7.6	737	Н	ALYS_ENTFA	P37710 enterococcu	_
9	178	7.6	1953	Н	BIGA_SALTY	P25927 salmonella	
7	177	7.5	1039	٦	AG43_ECOLI	P39180 escherichia	~
œ	177	7.5	1656	Ч	OMPB_RICJA	006653 r outer mem	_
თ	173.5	7.4	1577	ч	HLYA_PROMI	P16466 proteus mir	٠.
10	173	7.4	1567	7	ICEN_XANCT		"
11	172.5	7.3	933	-	SLAP_CAMFE	P35827 campylobact	
12	170	7.2	1300	7	120K_RICRI		
13	168	7.1	2021	-	OMPA_RICCN		
14	166	7.1	1645	-	OMPB_RICTY		_
15	165	7.0	1325	7	YDEK_ECOLI	P32051 escherichia	_
16	164		1025	П	SLAP_CAUCR	P35828 caulobacter	٠.
17	163	6.9	1569	7	YPJA_ECOLI	P52143 escherichia	~
18	161		1608	7	HLYA_SERMA	P15320 serratia ma	_
19			1286	П	AIDA_ECOLI	Q03155 escherichia	_
20	156.5	•	1001	7	Y741_CHLMU	Q9pjt6 chlamydia	_
21	156	٠	1861	П	APU_THETU		_
22	155	•	948	Н	HPI1_DEIRA	_	
23	154.5	9.9	1005	-	Y456_CHLTR	084462 chlamydia	
24	152.5	٠	918	-	YMJB_CAEEL	P34487 caenorhabdi	
25	152	6.5	1694	-	IGAO_HAEIN	P44969 haemophilus	,
56	152	6.5	1702	П	IGA2_HAEIN	P45384 haemophilus	•
27	151	6.4	550	П	FLIC_SHIFL	Q08860 shiqella fl	_
28	7	6.4	1643	٦	OMPB_RICPR		_
59	150.5	6.4	2660	П	YEEJ_ECO57	Q8x8v7 escherichia	~
30	150	6.4	1148	٦	ICEK_PSESX	O30611 pseudomonas	
31	12	6.4	1210	7	ICEN_PSEFL	'n	
32	149.5	6.4	484	Н	$\overline{}$	P21171 listeria mo	^
33	149.5	6.4	2358	-	YEEJ_ECOLI	P76347 escherichia	

P12021 sus scrofa O33479 pseudomonas	Q9rb65 chlamydia p Q09624 caenorhabdi	Q07833 bacillus su	P50493 plasmodium	P51181 bacillus li	Q10778 mycobacteri	P12255 bordetella	P18481 streptococc	
APMU_PIG ICEV_PSESX	PM10_CHLPN YS89_CAEEL	WAPA_BACSU	PVDB_PLAKN	KPYK_BACLI	YF48_MYCTU	FHAB_BORPE	TEE6_STRPY	ICEN_PSESY
				٦	~	,	Н	
1150	928 3178	2334	1153	582	678	3591	537	1200
6.3	6.3	6.2	6.1	6.1	6.1	6.1	6.1	6.1
148.5	147 146.5	146	144.5	144	144	144	143	143
34 35	36	38	40	41	42	43	44	4 5

ALIGNMENTS

	IN OMBA PICET	CTAN	CTANDADD.	. #da	2249 44				
AC P	P15921;		, GAND,	rui,	W C 1.77	·			
ĒΩ	01-APR-1990	(Rel.	14, Created)	d)	4				
점	16-0CT-2001	(Rel. 4	40, Last a	Last annotation update)	updace n upda	te)			
DE	Outer membrane protein A precursor (190 kDa antigen) (Cell	ane prot	ein A pre	cursor (190 kD	a antige	en) (C	ell surface	ě
D E	antigen) (rOmpA) (rOmp A).	OmpA) (1	Omp A).						
	ttsia	rickettsii	ii.						
ဗ		roteobac	teria; Al	phaprote	obacte	ria; Ric	cketts	iales;	
	Rickettsiac	eae; Ric	kettsieae	; Ricket	tsia.				
×	NCBI_TaxID=783;	783;							
Z C	[T]	× 11							
	STRAIN=R:	. K. K.							
ZX.	MEDLINE=90354033; PubMed=2117568;	54033; F	ubMed=211	7568;					
RA	Anderson B.E., McDonald G.A., Jones D.C., Regnery R.L.;	E., McDc	nald G.A.	Jones,	D.C.,	Regnery	R.L.;		
RT	"A protecti	ve prote	in antige	n of Ric	kettsi	a ricket	ttsii	nas tandemly	11.3
RT	repeated, near-identical sequences.";	ear-iden	tical seq	uences.					
3 5	-I- FINCTIO	JII. 38:2	CL. INMMIN. 38:2/00-2/09(1990). BINGTION: ELICITE BEOMEGHIVE IMMINITE	1990). PTVE TM	VETMI				
3 5	-I- STROFLL	TLAB LOC	FONCILON: ELICITS FROIECITYE IMMUNITI. STRUETITITAR LOCATION: CELL WALL THIS BACTERITM IS COVERED BY	I VE IM	THIE	AACTERTE	ST MI	אם תשמשעטי	4
		WITH HE	S-LAYER WITH HEXAGONAL SYMMETRY.	YMMETRY.			2		
r 1	-I- PTM: GL	COSYLAT	PIM: GLYCOSYLATED (PROBABLE).	BLE).					
F 1 1		ITY: BEL	ONGS TO T	HE RICKE	TTSIAE	OMPA/ON	MPB FA	IILY.	
, , ,									
	This SWISS-PROT entry is copyright. It is produced through a collaboration	PROT ent	ry is cop	yright.	It is	produced	d thro	igh a coll	aborat
	the Furones	a Swiss	ormatice.	or proj	11.01.111a	rres are	יים רוופ	EMBL OUT	station ste
	use by no	n-profit	institu	tions as	Jona I	35 175	Conte	at is ir	100
	modified and this statement is not removed. Usage by and for commercia	this s	tatement	is not r	emoved	. Usage	e by	and for c	for commercial
	entities requires a license agreement (See http://www.isb-sib.ch/announce/	quires a	license	agreemen	t (See	http://	/www.l	b-sib.ch/	announ
	or send an	email to	license	isb-sib.	ch).				
	TANDA MODOCOL SASSOCIONES DE LA COLONIA DE L							,	1
٠.	EMBL; M3122/; AAA2038U.1; PTR: A41477: A41477	7; AAAA20	380.1; -						
DR	InterPro; I	PR006315	, Autotra	sport.					
~	InterPro; IPR005546; Autotransporter.	PR005546	; Autotra	nsporter					
DR	Pfam; PF03797; Autotransporter; 1.	97; Autc	transport	er; 1.					
Z	TIGREAMS; T	IGR01414	; autotra	s_barl;	m ′	1			
X E	Antigen; Re	Kepeat; Si	Signal; Cell wall;	L WALL; S-I	S-Laye	S-layer; Glycoprotein	prote	'n.	
1 1	NIGHT		0249	OTTEN V	FMBDAN	FOIENITAL: OTHER MEMBRANE DEOTEIN A	Z N		
. E.	DOMAIN		1180	13 X AF	PROXIM	ER MEMBRANE PROIETIN A: X APPROXIMATE TANDEM REPEATS	DEM RE	EATS.	
F	REPEAT		286	A (TYPE	1).				
FT	REPEAT	287	358	B (TYPE					
FT	REPEAT	359	430	_					
F	REPEAT	431	505	_					
H .	REPEAT	206	7/5						
<u> </u>	REPEAT	9/8	652	F (TYPE					
- E-	REPEAT	725	799		11)				
F		3 6		•					
	REPEAT	200	*/×	I (TYPE					

```
Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 137; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EcoGene; EG11307; ydbA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2003 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local
       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                            27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                994 VVTGAIDNTGNANNGIVTFTGNSTVTGNVGNTNALATVNVGAGLLQVQGGVVKANTINLT 1053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNASAVTFTNPVVVTGAIDNTGNANNGI-VTFTGNSTVTGNV----GNTNALATVNVGA 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1278 FRARDSVLVLSNLTG---VGVNNILLAADLV---APGADE-----GTVVFNGGVNG 1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NR----IDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSS 431
                                                                                                                                                                                                                                                                                                                                        ----GATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDN 107
                                                                                                                                                                                                                                                                                                                                                                                                                                VDFVRTYDTVEFLSADTKTT----TVNVESKD---NG---KKTEVKIGAKTSVIKEKDGK 157
                                                                                                                                                                                                                                                                                                                                                                                  879 NSLATISVGAGTATLGGAVIKATTTKLTN-----AASVLTLTNANAVLTGAIDNTTGGDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            934 VGVLNLNGALSQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                249 AL-----NVN----NVN-----QLQNSGWNLDSKAVAGSSGKVISGNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPSKGKMDETVNINAGNNIEITRNG----KNIDIATSMTPQFSSVSLGAGADAP----T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----GNTNALATVNVGAGITLQAGGSLAANNIDFGARSTLEFNGPLDGGGKAIPYYFKGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LSVDDEGALNVGSKDANK - - - - - PVRITNVAPG - - - - VKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                           6 LINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDT -- TVHLNGIGSTLTDMLLNT
                                                                                                                                                                                                                                                                                       VIKATTTKLT - - - NAASVLTLTNANAVLTGAVDNTTGGDNVGVLNLNGALSQVTGDIGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LVTG----KGKGENGSSTDEGEGLVTAK----EVIDAVNKA------GWRMKTTTAN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------GQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=K12 / MG1655;
MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                              Length 2249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "The complete genome sequence of Escherichia coli K-12.";
K (TYPE II).
L (TYPE II).
M (TYPE II).
TYPE I (INCOMPLETE).
MW; A9D6646C089DF087 CRC64;
                                                                                                                                              DB 1;
                                                                                                                                                                                            60; Mismatches 214;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TDBA_ECOLI STANDARD; PRT; 2003 AA. P3366; P76087; P76088; P76859; P76859; P76859; P76859; P76859; P76859; P76859; P76859; P7687: 28, Created) 16-0CT-2001 (Rel. 40, Last sequence update) 16-0CT-2001 (Rel. 40, Last annotation update) Hypothetical protein ydbA. YDBA OR B1401/B1405. Escherichia coli.
                                                                                                                                           8.0%; Score 187.5; DB 22.4%; Pred. No. 0.034;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Enterobacteriaceae; Escherichia
950 1021
1022 1093
1094 1165
1166 1180
2249 AA; 224333 M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :: | | : | |
1323 LNVGSN--VAGTA 1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ISAGGNWIIKGTA 444
                                                                                                                                                                                          Matches 124; Conservative
                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      331
                                                                                                                                                                                                                                                                                                                                                                                                                                108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1167
                                                                                                                                                                                                                                                                                                                                   64
                                                                                               SEQUENCE
                                                                                                                                              Query Match
  REPEAT
REPEAT
                                                 REPEAT
                                                                         REPEAT
    FT
                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HAPPEN SERVICE OF THE                                                                                                                                                                                                                                                                                                                                       à
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the SWISS institute of Bioinformatics and the EMBL outstation - the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --NQLQNSGWN--LDSK-----AVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGQTGQADKFETVTSGTKVTFASGNGTTATVSKDD-----QGNITVKYDVNVGDALNV-- 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK---TEVKIGAKTSVIKE 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           393 G-DQAVVNNEGESAITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEI-AGNNGKVI-- 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          154 KDGKL-VTGKGKG---ENGSSTDEGEGLVTAKE-----VIDA----VNKAGWRMKTTTA 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESIGIQIDGDQAIVNNEG---ESTIT 505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 DETGLINV-ETEKLSFGANGKKVNIISD-----TKG-----LNFAKETAGTNGDTTVHLN 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----TNVTNDNVTDDEKKRAASVKDVLNAGWNIK 96
                           Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh: Kasai H., Kashimoto K., Kimura S., Kitakawa M., Kitagawa M., Maki T., Miki T., Mizobuchi K., Mori H., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito P. Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T., A 570-kb DNA sequence of the Escherichia coli K-12 genome Corresponding to the 28 0-40.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Biochimie 73:1361-1374(1991).
-1- SIMILARITY: TO S.TYPHINUTIUM ORF NEAR CYSG (AC P25928).
-1- CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THE GENE CODING THIS PROTEIN IS INTERRUPTED BY A HYBRID IS2D/IS30C ELEMENT BETWEEN AMINO ACIDS 839 AND 840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Moszer I., Glaser P., Danchin A.; "Multiple IS insertion sequences near the replication terminus Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      207; Indels 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1; Length 2003;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        205949 MW; B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -> V (IN REF. 2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0.032;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hypothetical protein; Complete proteome.
CONFLICT 489 I -> V (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8.0%; Score 187; 25.0%; Pred. No. 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL, AE000237; AAC74483.1; ALT_SEQ.
EMBL, D90778; BAA1509.1; ALT_SEQ.
EMBL, D90778; BAA1509.1; ALT_SEQ.
EMBL, D90779; BAA18880.1; ALT_SEQ.
EMBL, D90779; BAA18881.1; ALT_SEQ.
EMBL, X62680; -; NOT_ANNOTATED_CDS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-92190338; PubMed-1665988;
MEDLINE=97251357; Pubmed=9097039;
                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 464-2003 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       51 GIGSTLTDMLLNTGAT----
```

 $\boldsymbol{\alpha}$

```
(See http://www.isb-sib.ch/announce/
and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
 Usage by
                                                                                                                                                                          TIGRFAMS; TIGRO1414; autôtrans_bar1; 2.
Antigen; S-layer; Cell wall; Complete proteome.
CHAIN 1334 120 kba SURFACE-EXPOSED
CHAIN 1335 1655 32 kba BETA PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 180.5; DB 1;
Pred. No. 0.054;
59; Mismatches 225;
 modified and this statement is not removed.
               entities requires a license agreement (Soor send an email to license@isb-sib.ch).
                                                                                                                                InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                               Pfam; PF03797; Autotransporter; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SISAGGNWIIKGTASGNSRG 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLQIGGNYTADFVASADGTG 812
                                                                                                                                                                                                                                                                                                                                                                                                                                  168342 MW;
                                                         EMBL; AE008659; AAL03623.1; -.
                                                                       EMBL; AF123721; AAF34124.1;
EMBL; AF123726; AAF34129.1;
EMBL; AF149110; AAD39533.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 121; Conservative
                                                                                                                                                                                                                                      61
75
75
251
413
959
988
1139
354
776
11159
                                                                                                                                                                                                                                                                                                                                                                                                                   1492
                                                                                                                  PIR; E97835; E97835.
                                                                                                                                                                                                                                                                                                                                                                                                                                     AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                  1655
                                                                                                                                                                                                                                                                                                                                                                                      1159
1177
1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    793
                                                                                                                                                                                                                                                                                                                                          VARIANT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   321
                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                             VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                     VARIANT
                                                                                                                                                                                                                                                                                 VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 4
 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s SWISS-PROT entry is copyright. It is produced through a collaboration seen the Swiss Institute of Bioinformatics and the EWBL outstation - Buropean Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
                                              SGKVSLAGSMQVGDFSTGVDLNGNNNSVTLAAKDLKVVGQKATGINV-SGDAN-TVNITG 672
GAHGVENIGDNGTVNNKGDIVVSDTGSIGVLINGEGATVSNTGDVNVS-NEATGFSITTN 614
                                                                                                                                               ATAGLVQAYLPGKSMMAIGGGTYLGE------AGYAI------GYSSISAG 435
                                                                                                                                                                           733 KTSGLV-VIGDGNTVNMNGGLELIGEKNALADGSQVTSLRTGYSYTSVIVVSGESSVYLN 791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   australis, the most divergent rickettsia of the spotted fever group.";
Submitted (MAY-1999) to the EMBL/GenBank/DDBJ-databases.
-!- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROTEIN IS A MAJOR
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŝ
                                                                                                                NVLVDKDKTADNAAEYFFDPSVGINVYGSDNNVTLDGKLTVVSDSEVTSRQSNLFDGSAE
                           GKNIDIATSM-TPQFSS-VSLGAGADAPTLSVDD------EGALNVGSKDANKPVRITN
                                                                                                                                                                                                                                                                                                                      OWERA3; OSKUSB8; OSKUSA,
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
0uter membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) (Contains: 120 kDa surface-exposed protein (Surface protein
antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Mechanisms of evolution in Rickettsia conorii and R. prowazekii."; Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'Phylogenetic analysis of members of the genus Rickettsia using the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Stenos J., Walker D.;
"The rickettsial outer membrane protein A and B genes of Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E., Barbe V., Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M., Raoult D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                coding the outer-membrane protein rOmpB (ompB)."; J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                                                                                     VAPGVKEGDVTNVAQL - - - KGVAQNLNNRIDNVNGNARAGI - -
                                                                                                                                                                                                                                                                                                              1655 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=Indian tick typhus, and Malish 7;
MEDLINE=20393643; PubMed=10939649;
Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=21442074; PubMed=11557893;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 353-1655 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 33-1649 FROM N.A.
                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                       436 GNWIIKG 442
                                                                                                                                                                                                                                    792 GDTTISG 798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-Malish 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-Malish 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY
                                                                                                                                                                                                                                                                                                              OMPB_RICCN
                                                                                                                  673
                           304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    between
                                                                                                                                                                                                                                                                                             OMPB_RICCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -1-
                                                                                                                                                                                                                                                                                RESULT
                                                                                                                                                                                                                                                                                                                           δ
                                                                                     à
                                                                                                               q
                                                                                                                                              δ
                                                                                                                                                                          a
                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                   g
                                                       g
```

```
NTTLATGINLGS-AINPLAEINFGSKGAANVDIVLNVGKGVNL-YAINITTIDA---NVG 739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NRIDNVNG-NARAGIAQAIATAGLVQ-----AYLPGKSMMAIGGGTYLGEAGYAIGYS 430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SFIFNAGGTNIVSG-----TVGGQQGNKFNTVALDNGTTVKFLGNATFNGNTTIAAN-S 792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19 NGKKVNIISDTKGLNFAKETAGTNGDTTV-HLNGIGSTLTDMLLNTGATTNVT-NDNV-T 75
                                                         D -> A (IN STRAIN INDIAN TICK TYPHUS).

G -> S (IN STRAIN INDIAN TICK TYPHUS).

K -> N (IN STRAIN INDIAN TICK TYPHUS).

V -> A (IN STRAIN INDIAN TICK TYPHUS).

I -> V (IN STRAIN INDIAN TICK TYPHUS).

I -> V (IN STRAIN INDIAN TICK TYPHUS).

A -> T (IN STRAIN INDIAN TICK TYPHUS).

R -> L (IN STRAIN INDIAN TICK TYPHUS).

R -> L (IN STRAIN INDIAN TICK TYPHUS).

F -> S (IN REF. 3).

C -> S (IN REF. 3).

G -> S (IN REF. 3).

G -> S (IN REF. 3).

H -> R (IN REF. 3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGKVATIDGQVYAKDMVIQSANAVGQVNFRHIVDVGTDGTTAFKTAASKVAITQNSNFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            76 DDEKKRAASV----KDVLNAGWNIKGVKPGTTASDNVDFVRTYD----TVEFLSADTKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         100 IDFGNLAAQIIVPNTMTLNGNFTGDASNPGNTAG-----VITFDANGTLASASADANVAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         129 VN----VESKDNG------GKGENGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT-----SGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                515 ITLDGSATITG----DIGNAGG----AAALQGITLANDATKTLTLGGANIIGANGGTINF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 567 QANGGTIKLTS--TQNNIVVDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTVGANNKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          274 VISGNVSPSKGKM-DETVNIN---AGNN--IEITRNGKNIDIATSMTPO----FSSV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --SLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ASGNGTTATVSKDDQGNITVKYDV-----NVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1655;
PROTEIN.
```

26;

454 169 514 220 566

```
This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                | | : : | | : : | | | | THITTTDA----NVGSFVFNAGGTNIVSG-----TVGGQQGNKFNTVALENGTTVKFLGN 778
455 TNNITALEASGAGVVQLSGTHAAELRLGNAGSIFKLADGTVINGKVNQTALVGGALAAGT 514
                                                                                                                                   QANGGTIKLTST-----QNNIVVDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTIGAN 621
                                                                                                                                                                                                                                     I--DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDV 364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it use by non-profit institutions as long as its content is in no wa
                                                                ITLDGSATITGD--IGNAGGAAALQRITLAN-----DAKKTLTLGGANIIGAGGGTIDL
                                                                                                                                                                                         -----TATVSKDDQGNITVKYDV------NVGDALNVNQLQNSGWN-----LD
                                                                                                                                                                                                                                                                                                         TNVAQLKGVAQNLNNRIDNVNG-NARAGIAQAIATAGLVQ-----AYLPGKSMMAIGG
                                 STDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Firmicutes; Lactobacillales; Enterococcaceae; Enterococcus NCBI_TaxID=1351;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=V583 / ATCC 700802;
MEDLINE=22550857; PubMed=12663927;
MEDLINE=22550857; PubMed=12663927;
Paulsen I.T., Banerjei L., Myers G.S.A., Nelson K.E., Seshadri R., Feuts D.E., Eisen J.A., Gill S.R., Heidelberg J.F., Tettelin H., Dodson R.J., Omayam L., Brinkac L., Beanan M., Daugherty S., DeBoy R.T., Durkin S., Kolonay J., Madupu R., Nelson W. Vamathevan J., Tran B., Opton J., Hansen T., Shetty J., Khouri H., Utterback T., Radune D., Ketchum K.A., Dougherty B.A., Fraser C.M.; Rolle of mobile DNA in the evolution of vancomycin-resistant Science 299:2071-2074(2003).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN: LYSM REPEATS ARE THOUGHT TO BE INVOLVED IN PEPTIDOGLYCAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 M.lysodeikticus. May play an important role in cell wall growth and cell separation.
SUBCELLULAR LOCATION: Secreted (Probable).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ø
                                                                                                                                                                     SKAVA----GSSGKVIS-GNVSPSKGKMDETVNINAG-----NNIEITR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY: BELONGS TO FAMILY 73 OF GLYCOSYL HYDROLASES. SIMILARITY: Contains 6 LysM repeats.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15-SEP-2003 (Rel. 42, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
Autolysin precursor (BC 3.2.1.-) (Peptidoglycan hydrolase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDIINE-91358349; PubMed-1679432;
Beliveau C., Potvin C., Trudel J., Asselin A., Bellemare
"Cloning, sequencing, and expression in Escherichia coli
Streptococcus faecalis autolysin.";
J. Bacteriol. 173:5619-5623(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FUNCTION: Hydrolyzes the cell wall of E. faecalis and
                                                                                                                                                                                                                                                                                                                                                                             GTYLGEAGYAIGYSSISAGGNWIIKGTASGNSRG 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Enterococcus faecalis (Streptococcus faecalis).
                                                                                                                                                                                                                                                                                                                                                                                                             779 ATFNGNTTIAAN-STLOIGGNYTADCVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ä.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel. 30, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Beta-glycosidase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ALYS_ENTFA
P37710:
                                                                                                                                                                                                                                                                                                                                                                             417
                                                                 515
                                                                                                                                   267
                                                                                                                                                                     264
                                                                                                                                                                                                                                     307
                                                                                                                                                                                                                                                                       219
                                                                                                                                                                                                                                                                                                         365
                                                                                                                                                                                                                                                                                                                                           728
                                 170
                                                                                                 227
                                                                                                                                                                                                     622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALYS_ENTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                 δ
                                                                                                                                                                     δ
                                                                                                                                                                                                     g
                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                                                                                                                                                                                                           δy
                                 ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BY A S-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGKKVNIISDTKGLNFAKETAGTNGDTTV-HLNGIGSTLTDMLLNTGATTNVTNDN---VT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGKVATIDGQVYAKDMVIQSANATGQVNFRHIVDVGADGTTAFKTAASKVTITQDSNFGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DDEKKRAASVK - - DVLNAGWNIKG - - VKPGTTASDNVDFVRTYD - - - TVEFLSADTKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TDFGNLAAQIKVPNAITLIGNFTGDASNPGNTAG-----VITFDANGTLESASADANVAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----GKGENGS
                                                            30-MAY-2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) (Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   124; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                encoding the
                                                                                                                                                                                                                                                                                                  MEDLINE=92167802; PubMed=1724278; Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; The 120 Kilodalton outer membrane protein (rOmp B) of Rickettsia rickettsii is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor."; Mol. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rickettsia rickettsii.
Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SURFACE-EXPOSED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 1; Length 1654;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----KKTEVKIGAKTSVIKEKDGKLVTGK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1181 1188 POLY-THR.
1654 AA; 168184 MW; D7AB70FB7087F618 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ::
::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              kDa BETA PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0.058;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             _
<u>::</u>
                1654 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 0.05
64; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        send an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TIGRFAMS; TIGR01414; autotrans_barl; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR005315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <del>:</del>:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120 kDa
                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam; PF03797; Autotransporter; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                32
                                                                                                                                                                                                                                                                                                                                                                                                           [2]
SEQUENCE OF 279-1654 FROM N.A.
                                                (Rel. 39, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Antigen; S-layer; Cell wall.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; X16353; CAA34403.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 7.7
Best Local Similarity 23.9
Matches 123; Conservative
                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VN----VESKDNG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S18227; S18227
                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                     NCBI_TaxID=783;
                                              30-MAY-2000
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                 053047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or
                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
```

and for commercial

Usage by

```
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                  (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   268 SFQDNAHVLKTTSFQAGVYYYAGAWKSNTSSYRDATAWLT--GRYATDPSYNAKLNNVIT 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         71 NDNVTDDEKKRAASVKDVLNAGWNIKG--VKPGTTASDNVDFVRTY-----DTVEFLSA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | |:| : |:| | : |:| | : |:| | : |:| | : |:| | : |:| | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      326 AYNLTQ-----YDTPSSGGNTGGGTVNPGTGGSNNQSGTNTYYTVKSGDTLNKIAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                123 DTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDE-GEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF---ASGN--GTTATVSKDDQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              237 NITVKYDVNVGDALN-----VNQLQNSGWNLDSKAVAGSSGKVI-----SGNVSPSKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                494 GTNTYYTIKSGDTLNKIAAQYGVSVANLRSWNGISGDLIFAGQKIIVKKGTSGNTGGSS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              285 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSV--DDEGAL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----NVGSKDANKPVRITNVAPG-----VKEGDVTNVAQLKGVAQNLNNRIDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               603 GQKIIVKKGANSGSTNTNKP---TNNRGGATTSYTIKSGDTLN-----K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SFGANGKKVNIISDTKGLNFA----KETAGTNGDTTVHLNGIGSTLTDMLLNTGATTNVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     434 KSGDTLNKIAAQYGVSVANLRSWNGISGDLIFVGQKLIVKKGASGNTGGSNNGGSNNNQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    384 VNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYAIGYSSISAGGNWIIKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7.6%; Score 179.5; DB 1; Length 737;
                                                                                                                                                                                                                                                       TIGR; EF0799; ...
InterPro; IPR002482; LysM.
InterPro; IPR002482; LysM.
Pfam; PF01832; Amidase_4; 1.
Pfam; PF01815; LysM; 5.
SWART; SW00257; LysM; 6.
SWART; SW00057; Lyz2; 1.
Hydrolase; Glycosidase; Bacteriolytic enzyme; Cell wall; Cell division; Septation; Repeat. Signal.
53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ABB16BD506AC7507 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    55; Mismatches 208;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LYSM 1.
LYSM 2.
LYSM 4.
LYSM 5.
LYSM 6.
LYSM 6.
LYSM 6.
LYSM 7.
LYSM 6.
LYSM 6.
LYSM 6.
LYSM 6.
LYSM 6.
LYSM 6.
LYSM 7.
LYSM 7.
LYSM 7.
LYSM 1.
LYSM 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 0.024
modified and this statement is not removed.
                                          entities requires a license agreement (
or send an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     77025 MW;
                                                                                                                                                                              EMBL, AE016949; AAO80613.1;
PIR, A38109, A38109.
TIGR; EF0799;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23.0%;
                                                                                                                                               EMBL; M58002; AAA67325.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 111; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 476
484
567
737 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          111
ASG 692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ASG 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            499
567
633
695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHAIN
REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local
õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                            McClelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D., Leonard S., Nayyen C., Scott K., Holmes A., Grewal N., Mulvaney E., Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M., Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J. Bacteriol. 173:325-333(1991).
-!- CAUTION: Ref.3 sequence differs from that shown due to frameshifts in positions 414 and 732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Complete genome sequence of Salmonella enterica serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=LT2;
MEDLINE=91100301; PubMed=1987123;
Wu J. Y., Siegel L.M., Kredich N.M.;
"High-level expression of Escherichia coli NADPH-sulfite reductase: requirement for a cloned cysG plasmid to overcome limiting siroheme
                                                                                                                                       Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PUTATIVE SURFACE-EXPOSED VIRULENCE
BIGA_SALTY STANDARD; PRT; 1953 AA.

925927; 925028; 09xC03;
01-MAY-1992 (Rel. 22, Created)
28-FEB-2003 (Rel. 41, Last sequence update)
Putative surface-exposed virulence protein bigA precursor.
BIGA OR STM3478.
                                                                                                                                                                                                      SEQUENCE FROM N.A.
STRAIN-ATCC 14028;
Stojiljkovic I., Valentine P., Heffron F.;
"Salmonella typhiwurium rhs homolog.";
Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN BIGA.
15 x 11 AA TANDEM REPEATS.
1 (INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; M64606; AAA27042.1; ALT FRAME.
EMBL; M64606; AAA27043.1; ALT_FRAME.
StyGene; SG10437; blgA.
Virulence; Repeat; Signal; Complete i
SIGNAL
                                                                                                                                                                                                                                                                                                                             STRAIN=LT2 / SGSC1412 / ATCC 700720;
MEDLINE=21534948; Pubmed=11677609;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; AF133696; AAD39458.1; -. EMBL; AE008859; AAL22340.1; -.
                                                                                                                                                         Enterobacteriaceae; Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-765 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nature 413:852-856(2001).
                                                                                                                         Salmonella typhimurium.
                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                         NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
REPEAT
```

```
33;
                                                                                                                                                                                                                                                                NFAGDIAVSGGGTAIIIDGDNATIKNTGTSDISGAGSTGTVIDGNNARVNNDGDMTITDG 488
                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                    164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        848
                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                  ----DMLLNTG
                                                                                                                                                                                                                                                                                           AT-TNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSAD
                                                                                                                                                                                                                                                                                                                           ------GAD
                                                                                                                                                                                                                                                                                                                                                   TKTTTVNVESKDN-----GKKTEVKIGAKTSVIKEKDGK-----LVTGKG----K
                                                                                                                                                                                                                                                                                                                                                                               --ATALY IEG-DNALVINEGNOT-ISGGAVGTRIDGDDAHTTNTGDIAVDGAGSAAVIIN
                                                                                                                                                                                                                                                                                                                                                                                                            GENGSSTDEGEGLVT - - AKEVI - - DAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----ASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KNKGDIDVSLNGTGALVS-GDMSQVTLDGDINV---VSVQDSEGVFSSATGVSVSGDSNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           V-ISGNVSPS------KGKMDETVNINAGNNIEITRNGK-NI---DIATSMTPQFSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKG---VAQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GDNGSLTQAGDLLVTDGAMGIITYGTGNEA----KNTGNATVRDADSVGFVVAGEKNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        681 VDITGNVNISADYGQDDLAAGAPPLTGVVVGGNGNTVTLNGALNIDDNDLSATGGQYLDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LNNRIDN----GKSMMAIGGGTY
                                                                                                                                                                                                         65; Mismatches 171; Indels 164; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAINKI2 / MGIG55;
MEDLINE-97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LGEAG-----YAI----GYSSISAGGNWIIKGTASGNSRGHFGASASVG 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : | : | : : | : | : | : | : | | ENKGDITSHGVYSVIRADNGSEVSNSGDILVYATSSNSSEDRAAITRASG 899
11.

12.

13.

14.

15 (INCOMPLETE).

D -> DRGDDDVTPPDD (IN REF. 1).

A -> R (IN REF. 3).

D -> N (IN REF. 3).

QYLE -> ITLQ (IN REF. 1).
                                                                                                                                                                            Score 178; DB 1; Length 1953;
Pred. No. 0.088;
                                                                                                                                                                                                                                                                                                             ----TAHTNGIGSTLT-----
                                                                                                                                                MW; 611B3F1C954D91AE CRC64;
                                                                                                                OYLE -> ITLQ (IN REF. 1).
SA -> T (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AG43_ECOLI STANDARD; PRT; 1039 AA.
P39180; P75614; P76560; P97241; Q46771;
01-FEB-1995 (Rel. 31, Created)
11-OV-1997 (Rel. 35, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Antigen 43 precursor (AG43) (Fluffing protein).
                                                                                                                                                                                             Pred. No.
                                                                                                                                                                            7.68;
                                                                                                                                                200150
                                                                                                                                                                        Query Match
Best Local Similarity 24.7'
Matches 131; Conservative
                                                                                                                                                                                                                                     NFAKETAGTNGDT - -
                                                                                       514
1698
1798
1837
                                                                                                                                                   AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                         244
207
514
1698
1795
1936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OR B2000
                                                                                                                                                                                                                                                                                                                                                                                                            165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           274
                                                                                                                                                                                                                                     33
                                                                                                                                                                                                                                                               429
                                                                                                                                                                                                                                                                                                                                                    124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              849
                                                                                                                                                SEQUENCE
                                                                         CONFLICT
                                                                                                                                  CONFLICT
                                                                                       CONFLICT
                                                                                                      CONFLICT
                                                                                                                   CONFLICT
                REPEAT
REPEAT
                                             REPEAT
                                                          REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
   ò
                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                    Itoh T., Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Kasai H., Kimura S., Kitakawa M., Kitagawa M., Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T., Yamamoto Y., Horiuchi T., Ado-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Caffrey P., Owen P.; "Purification and N-terminal sequence of the alpha subunit of antigen "Purification and N-terminal sequence of the alpha subunit of antigen 43, a unique protein complex associated with the outer membrane of Escherichia coli.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEMS Microbiol. Lett. 149:115-120(1997).
--- FUNCTION: CONTROLS OLIONY FORM VARIATION AND AUTOAGGREGATION. MAY
FUNCTION AS AN ADHESTIVE
---- SUBUNIT: HETERODIMER OF THE PERIPHERAL MEMBRANE PROTEIN (ALPHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN=K12 / EMG2;
MEDLINE=97443975; PubMed=9298646;
Link A.J., Robison K., Church G.M.;
"Comparing the predicted and observed properties of proteins encoded in the genome of Escherichia coll K 12.";
Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE-97257509; PubMed-9103983;
Henderson I.R., Meehan M., Owen P.;
"Antigen 43, a phase-variable bipartite outer membrane protein,
determines colony morphology and autoaggregation in Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN) ANCHORED TO THE INTEGRAL OUTER MEMBRANE PROTEIN (BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SUBCELLULAR LOCATION: Outer membrane-associated. SIMILARITY: TO ADHESIN AIDI-I AND TO BORDETELLA PERTACTIN.
              "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                   STRAIN=ML 308-225;
Henderson I.R., Owen P.;
Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AE000291; AAC75061.1; ALT_INIT.
EMBL; D90838; BAA15825.1; ALT_INIT.
EMBL; D90839; BAA15832.1; ALT_INIT.
EMBL; U34429; BAA17869.1; -.
EKSSP; P07505; ISRD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
InterPro; IPR004899; Pertactin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam; PF03797; Autotransporter; 1. Pfam; PF03212; Pertactin; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteriol. 171:3634-3640(1989).
                                                                                                                     MEDLINE=97251358; PubMed=9097040;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-ML 308-225;
MEDLINE-89291704; PubMed=2661530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY SEQUENCE OF 53-78.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EcoGene; EG12686; flu.
                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 53-63.
Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENE NAME.
```

us-09-771-382-36.rsp

~

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            193 TQKAPLILADNALIVNGANGTLNVTNGFIQVSDKSFATVKAIN-IGDGQGFMFNTNATNA 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --- KDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               42 N-----GDTTVHLNGIGSTLTDMLLN-TGATTNVTNDNVTDDEKKRAASVKDVLNAGWN 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              95 IKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVN------VESKDNGKKTEV--KI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----KKVNIISDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                 Outer membrane protein B precursor (168 kba surface-layer protein) (Surface protein antigen) (Cell surface antigen 5) (Sca5) (Surface protein antigen) (Rompb) (Compains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompb); 32 kba beta peptidel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -1- FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Sequencing of the gene encoding the protein rOmp B of Rickettsia japonica.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61; Mismatches 212; Indels 208;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (MAY-1997) to the EMBL/GenBank/DDBJ databases.
-1- FUNCTION: THE 120 KDA SURFACE-EXPOSED PROFEIN IS A MAJOR
STRUCTURAL PROFEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
VIRULENCE PACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120 kDa SURFACE-EXPOSED PROTEIN.
32 kDa BETA PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 1; Length 1656;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              33 POLY-GLY.
168097 MW; 3132A69C9DD5999F CRC64;
                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pred. No. 0.082;
                                                                                                                                   1656 AA
                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7.5%; Score 177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pfan; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 2.
Antigen; S-layer; Cell wall.
                                                                                                                                                                                   30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence up
16-OCT-2001 (Rel. 40, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 TDETGLINVETEKLSFGANG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AB003681; BAA20138.1; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 22.3
Matches 138; Conservative
                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    145 GAKTSVIKE---
  566 PDNATVOS 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              528 5
1656 AA;
                                                                                                                                                                                                                                                                                                                                                                                                          Rickettsia japonica.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=35790;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Uchiyama T.;
                                                                                                                                   OMPB_RICJA
006653;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-YH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
                                                                                                             OMPB_RICJA
                                                                                 RESULT 8
                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IGAKTSV------IGAKTSV------IGAKTSV------IKEKDGKLVTGKGKGENGSSTDEGEGLV 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            404 AFSIGGGQADALMLEKGSSFTLNAG----DTATDTTVNGGLFTARGGTLAGTTTLNNGAI 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      399 AGLVQAYLPGKSMMAIGGGT----YLGEAGYAIGYS------SISAGGNWII 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            509 QKAVNL---NEGTLTLNDSTVTTDVIAQRGTALKLTGSTVLNGAIDPTNVTLASGATWNI 565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTLANHDNQIVFGTTNGMTI - - - - STGLEYGPDNEANTGGQWVQDGGTANKTTVTSGGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | :::| :: | : | | ORVNPGGSVSDTVISAGGGQSLQGRAVNTTLNGGEQWMHEGAIATGTVINDKGWQV--VK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                237 AGGDQTVHGHALDTTLNGGYQYVHNGGTASDTVVNSDGWQIVKNG-GVAGNTTVNQKGRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGTTASDNVDFVRT-----VDTVEFLSADTKTTTVN-----VESKDNGKKTEVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PGTVATDTV - - VNTGAEGGPDAENGDTGQFVRGDAVRTTINKNGRQIVRAEGTANTTVVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          296 QVDAGGTATNVTLKQGGALVTSTAATVTGINRLGAFSVVEGKADNV-VLENGGRLDVLTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HTAINT-RVDDGGTLDVR---NGGTATTVS-MGNGG-----VLLADSGAAVSGTRSDGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLINVETEKLSFG-ANGKKVNIISDTKGLNFAKET-----AGTNGDTTVHLNGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----GSTLTDMLLNTGATTNV----TNDNVTDDEK---KRAASVKDVLN-AGWNIKGVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAKEVIDAVN---KAGWRMKTTTANGQT-------GQADKFETVTSGTKVTFASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----GKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LTLSGKTVN-----NDTLTIREGD----ALLQGGSLTGNGSVEX-SGSGTLTVSNTTLT
                                                                   ANTIGEN 43 ALPHA CHAIN.

1039

ANTIGEN 43 BETA CHAIN.

42

SL -> FF (IN STRAIN ML 308-225).

45

T -> K (IN STRAIN ML 308-225).

157

W -> L (IN STRAIN ML 308-225).

157

W -> L (IN STRAIN ML 308-225).

157

W -> E (IN STRAIN ML 308-225).

305

ATN -> STI (IN STRAIN ML 308-225).

310

ATN -> STI (IN STRAIN ML 308-225).

493

E -> V (IN STRAIN ML 308-225).

585

E -> V (IN STRAIN ML 308-225).

585

E -> V (IN STRAIN ML 308-225).

720

M -> T (IN STRAIN ML 308-225).

721

M -> T (IN STRAIN ML 308-225).

723

M -> T (IN STRAIN ML 308-225).

803

S -> P (IN STRAIN ML 308-225).

815

C -> S (IN STRAIN ML 308-225).

825

HOLVHTS -> MULTYNA (IN STRAIN ML 308-225).

825

HOLVHTS -> MULTYNA (IN STRAIN ML 308-225).

825

HOLVHTS -> MULTYNA (IN STRAIN ML 308-225).

825

HOLD STRAIN ML 308-225).

826

C -> L (IN STRAIN ML 308-225).

827

HOLD STRAIN ML 308-225).

828

HOLD STRAIN ML 308-225).

835

HOLD STRAIN ML 308-225).

837

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

839

HOLD STRAIN ML 308-225).

837

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

839

HOLD STRAIN ML 308-225).

837

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

838

HOLD STRAIN ML 308-225).

839

HOLD STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 206; Indels 144; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1; Length 1039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; Score 177; DB 1
; Pred. No. 0.048;
84; Mismatches 2
                            Signal; Complete proteome.
  autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches 114; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441 KGTASGNS 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1039 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                         Outer membrane;
SIGNAL 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       460
                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
VARIANT
VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                            VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                    VARIANT
VARIANT
                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT
                                                                                                                                                                                                                  VARIANT
                                                                                                                                                                                                                                                                                                                            VARIANT
                                                                              CHAIN
NAME OF THE PART O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

ŝ

Ą

30;

ω

```
DR
KW
FT
SO
                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                           QQ
                                                                                                                                                                                                                                                                                                                                                             δy
                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                              Q
                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                ğ
                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                   351 YAKDMVIQSANANGQVNFRHIVDVGIDGTTAFKTAASIVAITQNSNFGTTDFG-NLAAQV 409
                                                 299 EITRNGKNI----DIATSMTPQFSSVSLGAGADAPTLSVDDE------GALNVGS 343
                                                                                                                                                                                                                                                                                                344 KDA---NKPVRITNVAPGVKEGDV-----TNVAQLKGVAQNLNNRIDNVNGNARAG 391
                                                                                                                                                                                                                                                                                                                   392 IAQAIATAGLVQAYLPGK----SMMAIGGGTYLGEAGYA-----IGYSSISAGGN 437
                                EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                 242 YDVNVGDALNVNQLQNSGWNLDSKAV--AGSSGKVISGNVSPSKGKMDETV-----
                                                                                                                                456 NNITAIEASGVGVVQLSGTHTAELRLGNAGSVFKLADGTV--INGKVNQTVLVGGVLAAG
                                                                                                                                                                                                514 AITLDGSATITGDIGNGGGGAALQSITLANDATKTLTLGGANIISANGGTINFQANGGTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUBCELLULAR LOCATION: Outer membrane.

MAY BE RESPONSIBLE FOR PORE FORMATION.

SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             uphoff T.S., Weich R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent
"Nucleotide sequencing of the Proteus mirabilis calcium-independent
"Nucleotide sequencing of the Proteus sequence similarity with the
Serratia marcescens hemolysin genes (shla and shlb).";
J. Bacteriol. 172:1206-1216(1990).
-I- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD
CELL MEMBRANDS AND CAUSE CELL RUPPURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales; Enterobacteriaceae; Proteus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A., AND SEQUENCE OF 30-43.
STRAIN=Isolate 477-12;
MEDLINE-90170827; Pubmed-2407716;
                                                                                                                                                                                                                                                                                                                                                                                                                                  WIIKGTASGNSRGHFGASA 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                               748 NIVSGTVGGQQGNKFNTVA 766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; M30186; AAA25657.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-AUG-1990 (Rel. 15, 01-AUG-1990 (Rel. 15, 01-NOV-1990 (Rel. 16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Proteus mirabilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HLYA_PROMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P16466;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 9
                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                õ
                                                                 8
                                                                                                 ò
                                                                                                                              g
                                                                                                                                                                 ŏ
                                                                                                                                                                                                g
```

```
1099 VGT--TPE--SKDYGGGFNAGTTHHSKEQTTAKVGTITGSQGIELNAGHNLTLQG--THL 1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1153 SSEQDIALNATNKVDLQSASSEHTEKGNNLSGGVQAGF-------GKKMTDD 1197
                                                                                                                                                                                                                                                                                                                                        208 KFETVTSGTK----VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGW--N 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---NGK-NID 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         309 IATSMIPQFSSVSLGAGADAPIL-SVDDEGALNVGSKDANKPVRIINVAPGVKEGDVINV 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           871 LDYSGVTKPVKKAIEDGVNT-TKPGNNTDLTKKVTARDAIANLANLSNLETPNVGVEVGI 929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           930 KGGGSQQSQTDSQAVSTSINAGKIDIDSNNKLHDQGTHYQSTQEGISLTANTHTSEATLD 989
                                                                                                                                                                                                                                                                                                                                                                                      ------ESKDNGKKTEVKIGAKTSVIKE---KD-------GKLVTG 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                            KGKGENGSSTDE---GEGLVTAKEVIDAVNK---AGWRMKTT-----TANGQTGQA--D 207
                                                                                                                                                                                                                                                                                                                VKDVLNAGWNIKGVKPGTTASDNVD--FVRTYDIVEFL----SADTKTTTVNV----- 131
                                                                                                                                                                            DTTVH------LNGIGS-----TLTDMLLNTGATTNVTND-NVTDDEKKRAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Conserved repetition in the ice nucleation gene inax from Xanthomonas campestris pv. translucens.";
Mol. Gen. Genet. 223:163-166(1990).
--- FUNCTION: ICE NUCLEATION PROTEINS ENABLE BACTERIA TO NUCLEATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Xanthomonas campestris (pv. translucens).
Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales;
Xanthomonadaceae; Xanthomonas.
                                                                                                                                       199;
                                                                                                    Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     262 LDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -MAIGGGTYLGEAGYAIG---YSSISAGGNWIIKG---TASGNS 448
                                                                                                                                         Indels
                                                   77 HEMOLYSIN.
165869 MW; 175975E0C924B2D9 CRC64;
                                                                                                      DB 1;
                                                                                                                                         168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
                                                                                                    7.4%; Score 173.5; Di
22.6%; Pred. No. 0.12;
ive 85; Mismatches
PIR; A35140; A35140.
Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=91080859; PubMed=2259339;
                                                                                                                       22.6%;
                                                                                                                         Local Similarity 22.69
nes 132; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ice nucleation protein.
                                                   1577
                                                 30 157
1577 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Orser C.S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=343;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ICEN_XANCT P18127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-NOV-1990
16-OCT-2001
                                                                                                                                                                                                                                                  44
                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                      85
                                                                                                                                                                                                                                                                                                                                                       823
                                                                                                                                                                                                                                                                                                                                                                                                                                                              162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     412
                                                                                                        Query Match
                                    SIGNAL
                                                                                                                                             Matches
```

```
structure.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    109
                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEOUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          308
                                                                                                                                                               [2]
ERRATUM.
  рp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the BMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LIAGYGSTQTSGS-------DSSLTAGYGSTQTAREGSDVTAGYGSTGTAGD 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1016 STLIAGYGSTQTAGSD--SSLTAGY----GSTQTARQGSDVTAGYGSTGTAGADSTLIAG 1069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1120 STQTAGYDSNLTAGYGSTQTAREDSSLTAGYGSTSTAGHDSSLIAGYGSTQTAGYNSILT 1179
                                                                                                                                                                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGK 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                      364 STGTAGADSTLISGYGSTOT----AGSDSSLTAGYGSTOTARKGSDV----TAGYGSTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----TAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDMTAGYGSTGTAGADST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     158 LVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          218 VTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             278 NVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TA-GLVQAYLPGKSMMAIGGGTYLGEAGY----AIGYSSISAGG--NWIIKGTASGNSRG
                                                                                                                                                                                                                                                                                                                                                                                                                            38 TAGINGDITVHLNGIGSTLIDMLLNTGATINVINDINVIDDEKKRAASVKDVLNAGWNIKG
                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                MISCELLANEOUS: A STRUCTURAL MODEL IS SUGGESTED IN WHICH THE ICE NUCLEATION PROTEIN DISPLAYS A SYMMETRY RELATED TO THAT OF ICE SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTEIN
            SUBCELLULAR LOCATION: Outer membrane (By similarity).
DOMAIN: CONTAINS 153 IMPERENCT REPEATS OF THE CONSENSUS
OCTAPEPTIDE A-G-Y-G-Y-G-T-L-T; FURTHER ON A 16-RESIDUE AND A
REGIONAL 48-RESIDUE PERIODICITY IS SUPERIMPOSED.
                                                                                                                                                                                                                                                                                                                                                                                                  90;
                                                                                                                                                                                                                                                                                                                                                                    ; Score 173; DB 1; Length 1567;
; Pred. No. 0.12;
67; Mismatches 220; Indels 66
                                                                                                                                                                                                                                                                                 PRINTS: PRO0319; ICE_NUCleation; 81.
PRINTS: PR0037; ICENUCLEATIN.
PROSITE; PS00314; ICE_NUCLEATION; 57.
ICE NUCLEATION; SPEAT: Outer membrane.
SEQUENCE 1567 AA; 152548 MW; C8B451D959ECAD63 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-JUN-1994 (Rel. 29, Created)
01-JUN-1994 (Rel. 29, Last sequence update)
01-OCT-1994 (Rel. 30, Last annotation update)
Salayer protein (Surface array protein) (SAP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            933 AA
 CRYSTALLIZATION IN SUPERCOOLED WATER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                        InterPro; IPR000258; Ice_nucleatn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1238 HESSLIAGYGSTQIAGYE 1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              451 H-----FGASASVGYQ 461
                                                                                                                                                                                                                                                                                                                                                                       7.48;
20.88;
                                                                                                                                                                                                                                              EMBL; X52970; CAA37140.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                  91; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLAP_CAMFE
P35827;
                                                                                                                                                                                                                                                                                                                                                             Query Marc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 11
SLAP_CAMFE
                                                                                                                                                                                                                                                                                                                                                                                                  Matches
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEPPE
                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DFVRTYDTVEFLSADTKTTTVN-VESKDNG-------KKTEVKIGAKTSVIKE 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     438 ALTAAIDI-----KSASTLNLINSSVNGPKHLYSSKRRYCKFKRAAAKVKLNTTAATD 490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               491 OTVTLKANATDNSLEFDSATAKTTSVTASGSGKTLVIKGAEVETLVN----IDTTAFNA 545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             546 LOSVSFGKTGOGGKFSVKTGTGDDKIEFV---GTTLTEGSVIDAPGNDTIAMKSAALTSA 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    656 TAADAGSVKLITVKLN---DVTALMIVVKIVLDAAAKD-----TNIALGTAAADKALV 705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGG------ 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          319 -ETTGTITAFTAAGTGKVDVVAGKISALTADSRTSVNLTATNDTITLTSANAATSVNLKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----NGDTTVHLNGIGSTLTDMLLNTGATTNVTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNVTD------DEKKRAA-----SVKDVLNAGWNIKGVKPGTTASDNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               378 RQAKDATITSAMQQKYNNRRNRIATITSATAVENLTVKHATNVALNGGMDKLATVTLDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             K-----DGKLVTGKGKGENGSSTDEGEG---LVTAKEVIDAVNKAGWRMKTTTAN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 TDETGLI-----NVET------RKLSFGANGKKVNIISD-TKGLNFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       260 TDQAELIITKRRTNVENINIISDLETSGDFVFNGYEKVGFNVLGDIVSFATDASKSVNV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----GQTGQADKF--ETVTSGTKVTFASGNGTTATVSK--DDQGNITVKYDVNVGDAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVNQLQNSGWNLDSKAVAG---SSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NFTMIKNIENVAISDAVATADLSSSAFKNSVIITTKEAADTTLTINKDQVI-----NF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Blaser M.J., Gotschlich E.C.;
J. Bilol. Chem. 265:19372-19372(1990).

-i- Full. Chem. 265:19372-19372(1990).

-i- FUNCTION: THE S.LAYER IS A PARACRYSTALLINE MONO-LAYERED ASSEMBLY OF PROTEINS WHICH COAT THE SURFACE OF BACTERIA. THIS PROTEIN IS CRITICAL FOR YIRULENCE.

-i- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A S-LAYER WITH HEXAGONAL SYMMETRY.
Bacteria; Proteobacteria; Epsilonproteobacteria; Campylobacterales;
                                                                                                                                                                                                                                                             Blaser M.J., Gotschlich E.C.; "Surface array protein of Campylobacter fetus. Cloning and gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 172.5; DB 1; Length 933;
Pred. No. 0.072;
9; Mismatches 219; Indels 177,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        wall; S-layer.
ENCE 933 AA; 96757 MW; F88C729B4BA5B1E9 CRC64;
                                                                                                                                             AND SEQUENCE OF 1-20
                                                                                                                                                                                                                                                                                                                                                                        Biol. Chem. 265:14529-14535(1990)
                                              Campylobacteraceae; Campylobacter
                                                                                                                                                                                    STRAIN=84-32 / 23D;
MEDLINE=90354448; PubMed=2387868;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=91035477; PubMed=2229082;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7.38; 21.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; J05577; AAA23032.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      al Similarity 21.8
127; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            36 KETAGT-----
                                                                                                                                                 SEQUENCE FROM N.A.,
                                                                            NCBI_TaxID=196;
```

Page 10

us-09-771-382-36.rsp

```
OMPA OR RC1273.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=781;
                                                       CARBOHYD
CARBOHYD
CARBOHYD
 CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                 CARBOHYD
CARBOHYD
                                                                                                                                                       CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                       92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              435
                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                           qq
   FT FT FT S
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ογ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ολ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
---IDTGIETLNITSLVKATSPETTANTVNAKLTDVTSIIIDGMQITLGHAGTA 756
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gilmore R.D. Jr., Joste N., McDonald G.A.;
"Cloning, expression and sequence analysis of the gene encoding the "Cloning, expression and sequence analysis of the gene encoding the 120 kb surface-exposed protein of Rickettsia rickettsii.";
Mol. Microbiol. 3:1579-1586(1989).
-!- FUNCTION: MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNGEN DURING INFECTION.
-!- SUBCELLOLAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A S-LAYER WITH HEXAGONAL SYMMETRY.
-!- MISCELLANBOUS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EPITOPES CONFERRING ANTIGENICITY TO THE PROTEIN.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
                                                             GTYLG-------EAGYAIGYSSISAGGNWIIKGTASGNS 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Tight | Tigh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL)
                                                                                                                                                                                                          (Rel. 14, Created)
(Rel. 33, Last sequence update)
(Rel. 41, Last annotation update)
                                                                                                                                                                         PRT; 1300 AA
                                                                                                                                                                                                                                                                                                                                              Rickettsiaceae; Rickettsieae; Rickettsia.
NCBL_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                    120 kDa surface-exposed protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; X16353; CAA34402.1; -.
                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                        Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S07575.
                                                                                                                                                                                                                                                                                                                                                                                                       FROM N.A.
                                                                                                                                                                                                            01-APR-1990
                                                                                                                                                                                                                              01-FEB-1996
                                                                                                                                                                                                                                                  28-FEB-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S07575
                                                                                                                                                                         L20K_RICRI
                                 417
                                                                         757
                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-R
                                                                                                                                                                                        P14914;
                                                                                                                                   RESULT
                                                                                                                                                                                          셤
                                     ò
                                                                       q
```

```
29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      322
                                                                                                                                                                                                                                                                                                                                                                                          GWNIKG--VKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG---- 137
                                                                                                                                                                                                                                                                                                                                                                                                                              64 TGNFTGDASNPGNTAG----VITFDANGTLESASADANVAVTNNITAIEASGAGVVQLS 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           119 GTHAAELRLGNAGSIFKLADGTVINGKVNQTALVGGALAAGTITLDGSATITGD--IGNA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NVNG-NARAGIAQAIATAGLVQ-----AYLPGKSMMAIGGGTYLGEAGYAIGYSSISA 434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91
                                                                                                                                                                                                                                                                                                                                                  4 OSANATGOVNFRHIVDVGADGTTAFKTAASKVTITQDSNFGNTDFGNLAAQIKVPNAITL 63
                                                                                                                                                                                                                                                                                                             37 ETAGTNGDTTV-HLNGIGSTLTDMLLNTGATTNVTNDN--VTDDEKKRAASVK--DVLNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --KKTEVKIGAKTSVIKEKDGKLVTGK------GKGENGSSTDEGEGLVTAKEVIDAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 188 NKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGT------TATVSKDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNITVKYDV-----GSSGKVIS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGAAALQRITLAN-----DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLTST----Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNVSPSKGKMDETVNINAG-----NNIEITR-----NGKNI--DIATSMTPQFSSVSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRID
                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Outer membrane protein A precursor (190 kDa antigen) (Cell surface antigen) (CompA) (TOMpA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OMPA_RICCN STANDARD; PRT; 2021 AA. 052657; P95591; P95593; P95594; Q52667; Q52669; Q52669; Q52670; Q52674; Q52674; Q52674; Q52674; Q5267140, Created) 16-0CT-2001 (Rel. 40, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                       63; Mismatches 190; Indels 124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                   DB 1; Length 1300;
                                                                                                                                                                                               E09E52C3F647243D CRC64;
                                                                          (POTENTIAL)
                                                          POTENTIAL)
                                                                                                                (POTENTIAL)
                                                                                                                                                      N-LINKED (POTENTIAL)
N-LINKED (POTENTIAL)
                                        POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN-Malish 7;
STRAILNE-94171067;
Crocquet-Valdes P.A., Weiss K., Walker D.H.;
                                                                                                                                                                                                                                 Score 170; DB Pred. No. 0.14;
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                             132801 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           442 GGNYTADCVASADGTG 457
                                                                                                                                                                                                                                   7.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGNWIIKGTASGNSRG
                                                                                                                                                                                                                                 Ouery Match 7.2
Best Local Similarity 24.0
Matches 119; Conservative
844
861
879
920
926
11116
1128
1140
                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rickettsia conorii
                                    879
920
926
11116
11128
1140
1146
1211
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N -> NN (IN STRAIN INDIAN TICK TYPHUS).
R -> H (IN STRAIN INDIAN TICK TYPHUS).
MISSING (IN STRAIN MI).
NISSING (IN STRAIN MOROCCAN).
VT -> II (IN STRAIN INDIAN TICK TYPHUS).
D -> A (IN STRAINS INDIAN TICK TYPHUS). MI
                                                                                                                                                                                                                                                                                                                                          STRAIN=Indian tick typhus, M1, Malish 7, and Moroccan; MEDLINE=97015921; PubMed=886258; Roux V. Fournier P.E., Raoux U. Fournier P.E., Raoux U. Fournier P.E., Raoux G. Tournier D.E., Raoux G. Tourni
"Sequence analysis of the 190-kDa antigen-encoding gene of Rickettsia conorii (Malish 7 strain).";
Gene 140:115-119(1994).
                                                                                                                                                                               Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E., Barbe V., Sanson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M.,
                                                                                                                                                                                                                                                 "Mechanisms of evolution in Rickettsia conorii and R. prowazekii."; Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N -> H (IN STRAIN MOROCCAN).

N -> I (IN STRAIN INDIAN TICK TYPHUS).

Q -> K (IN REF. 1).

I -> V (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 953-2012 FROM N.A. STRAIN=Indian tick typhus, MI, Malish 7, and Moroccan; Raoult D., Fournier P.E., Roux V.; "Phylogenetic analysis of spotted fever group rickettsiae by study
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Antigen; Repeat; Signal; Cell wall; S-layer; Glycoprotein; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OUTER MEMBRANE PROTEIN A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro: IPR006315; Autotransport.
Pfam; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  THR-RICH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THR-RICH.
                                                                                                  SEQUENCE FROM N.A.
STRAIN-Malish 7;
MEDLINE-21442074; PubMed-11557893;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL, U01028, AAA17405.1;
EMBL, AE008674; AAL03811.1;
EMBL, U43794; AAB49550.1;
EMBL, U43806; AAB49550.1;
EMBL, U42806; AAB49551.1;
EMBL, U45244; AAB49566.1;
EMBL, U46918; AAR46663.1;
EMBL, U46918; AAR86663.1;
EMBL, U83440; AAC35176.1;
EMBL, U83443; AAC35184.1;
EMBL, U83453; AAC35184.1;
                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 8-204 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                38
2021
946
1528
60
76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      133
954
1245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1308
1877
10
92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1308
1877
10
92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CHAIN
DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /ARIANT
                                                                                                                                                                                                                              Raoult
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIGNAL
```

				30;	61 669	121	167	200	234	294 951	344 1011	354 1071	389 1124	436 1184
V -> I (IN REF. 1). T -> N (IN REF. 1). G -> D (IN REF. 1). IS -> VN (IN REF. 1). SATLGALIKATTTK -> LLQVGGVVKANTIN (IN BEP. 1).	REF. 1). REF. 1). REF. 1). IN REF. 1	(IN REF. 1).	G - N (IN REF. E - S (IN REF. A -> V (IN REF. T -> P (IN REF. MS -> LP (IN REF. MS -> LP (IN REF. E -> A (IN REF. MTAPLP -> ITPPLS G -> R (IN REF. S -> R (IN REF.	; Score 168; DB 1; Length 2021; ; Pred. No. 0.29; 65; Mismatches 209; Indels 208; Gaps	ETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 	KKRAASVKDVLNAGMNIKGVKPGTTASDNVDEVRTYDTVEFLS	ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGEN :	DEGEGLVTAKEVIDAVNKAGWRMKTTTAN	GQTGQADK-FFETVTSGTKVTFASGN-GTTATVS	QGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINA :	TRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSK: :	DANK-PVRITN	VAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGNAR 	AGIAQAIATAGLVQAYLPGKSWMAIGGGT-YLGEAGYAIGYSSISAGG
126 137 157 369 388	640 669 793 804 823	898 908 1008 1013 1182 1314	1624 1628 1628 1875 1875 1970 1997 AA; 20332	7.1% ty 21.8% ervative	VETEKLSFGA	NTGATTNVTNDNVTDDE : IKATTTKLTN	TVNV :: ALATISVGAG	DEGEGLVTAK : FTGDSTVTGNIGN	GQADK-FET' : GNANNGIVT	YDVNVGDALN 	-TRNGKNIDIAT : : GSLDANNIDFGA	TIGTVAEINIGAGNLF	APGVKEGDV APGVDEGTVVF	AQAIATAGLVQAYLPGK : : TDDVNLEGIQNVLINNN
126 137 157 368 374	640 669 793 803 809	898 908 985 1009 11182 1314	1624 1624 1628 1872 1875 1936 1965 1997	Similarity 4; Conserv	DETGLIN DNTGNAN	NTGATTNVTND : IKATTTKLTN-	ADTKTT- : GNIGNTN	GSSTDEG : GIATFTG	GQT TGAIDNT	OGNITVK : ASAVTFT	GNNIEI' :: GVTLQAGG:	AXHLTIG	VA 	AGIAQAI : VTITDDV
CONFLICT CONFLICT CONFLICT CONFLICT	CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT	CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT	CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT CONFLICT	ery Match st Local cches 13	625	62	122	168	201	235	295	345	355	390
			Z E E E E E E E E E E E E E E E E E E E	Que Bee	Qy	QY	QY Db	QY Db	QY	QY	QY	QQ Dp	Qy	Qy

```
136;
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                           175
                                                                                                                                                                                                                                                                                                                                   133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     345
                                                                                            Query Match
                                                                                                          Best Local
                                                                                                                        Matches
   SFF
                                                                                                                                                                                g
                                                                                                                                                                                                              δŽ
                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                         ΩŽ
                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                   δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                       Pp
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωÿ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-92104668; PubMed-1729180;
Hackstadt T., Messer R., Cieplak W., Peacock M.G.;
Hackstadt T., Messer R., Cieplak W., Peacock M.G.;
Fortion of proteolytic cleavage of the 120-kilodalton outer membrane protein of rickettsiae: identification of an avirulent mutant deficient in processing.";
Infect. Immun. 60:159-165(1992).
I FUNCTION: THE 120 kDa SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETISIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
I'F FUNCTION: THE 32 kDa BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR.
I'SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A S-LAYER WITH HEXAGONAL SYMMETRY.
I'SUBCELLULAR SYMMETRY.
                                                                                                                                                 15-JUL-1998 (Rel. 36, Last sequence update)
15-JUL-1998 (Rel. 36, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpB)
(rOmp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                                                                                                                                                                                                                                                                                                                                            STRAIN=Wilmington;
MEDLINE=94040787; PubMed=8224886;
Hahn M.-J., Kim K.-K., Kim I., Chang W.-H.;
"Cloning and sequence analysis of the gene encoding the crystalline surface layer protein of Rickettsia typhi.";
Gene 133:129-133(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ching W.M., Carl M., Dasch G.A.;
"Mapping of monoclonal antibody binding sites on CNBr fragments of
the S-layer protein antigens of Rickettsia typhi and Rickettsia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHAIN 1354 1645 32 kDa BETA PETITDE.

TRANSMEM 1415 1429 MEMBRANE ANCHOR (POTENTIAL).
                                                                                                                                                                                                                                                                      Rickettsia typhi.
Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID-785;
                                                                                                                        PRT; 1645 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam; PF03797; Autotransporter; 1.
TIGRFAMs; TIGR01414; autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-Wilmington; MEDLINE-92114896; PubMed-1370573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          [3]
IDENTIFICATION OF CLEAVAGE SITE.
                               :| :||| |
1185 HADAQLILQNSSGNDR 1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mol. Immunol. 29:95-105(1992).
                 ---NWIIKGTASGNSR 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; L04661; AAB48987.1; -.
                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JN0896
                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PARTIAL SEQUENCE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIR; JN0896;
                                                                                                                                                                                                                                                           OMPB OR SLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          prowazekii.
                                                                                                                        OMPB_RICTY
P96989;
                                                                                                          OMPB_RICTY
                                                                                          RESULT 14
                                                                                                                                    셤
                 å
```

```
388 ARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLGEAGYA-----IGYSSISAGGNW 438
                                                                                                                                                                                                                                                                                                                  251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KGV-KPGTTA-----SDTTTTTVNVE 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---DIATSMTPQFSSVSL------GAGADAPTLSVDDEGALNVGSK 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----DANKPVRIT-NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVNGN 387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              695 NLGSAESPLSNIHFATKAANGDSILHIGKGVNL---YANNITTTDANVGSLHFRSGGTS 750
                                                                                                                                                                                                                                                                                                                                                                    95
                                                                                                                                                                                                                                                                                                  | | | : |: ||||
93 TOEAPLTLGDNAKIVNGANGILNITNGFVKVSDKTFAGIKTIN-IGDNQGLMFNTTPDAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       216 TKVTFASG-----NGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----KKVNIISDTKGLNFAKETAGT
                                                                                                                                                                                                                                                                                                                                                                    42 N-----GDTTVHLNGIGSTLTDMLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNI
                                                                                                                                                                                                                                                                                                                                                                                                                  252 NALNLOGGGUTINFNGRDG--TCKLVLVSKNGNATEFNVTG------SLGGNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKD-----NGKKT----EVK1GAKTSV1KEKDGKLVTGKGKGENGS--STDEG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----EGLVTAKEVIDAVNK---AGWRMKTTTANGQ--TGQADKFETVTS-----G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              407 VQIVVPNNKILTGNFIGDAKNNGNTAG--VITFNANGTLVSGNTDPNIVVTNIKAIEVEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 465 AGIVQLSGIHGAELRLGNAGSIFKLADGTV-INGPVNQNPLVNNNALAAGSIQLDGSAII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      269 GSSGKVISGNVSPSKGKMDET-----VNINAGNNIEITRNGKNI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      524 --TGDI--GNGAVNAALQDITLANDASKILTLSGANIIGANAGGAIHFQANGGTIQLTST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           635 KTILNAGDVAINELVMENDGSVHLTHNTYLITKTINAANQGKIIVAADPINTDTALADGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
STRAIN=K12 / MG1655;
MEDLINE=97426617; Pubmed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                             DB 1; Length 1645;
                                                                                                                                                                                                                  209; Indels
                                                                                                             OCB5641C7EB185EE CRC64;
     1 -> N (IN REF. 2).
7 -> I (IN REF. 2).
5 -> A (IN REF. 2).
5 -> S (IN REF. 2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YDEK_ECOLI STANDARD; PRT; 1325 AA. P32051; P76140; P77168; O1-00T-1993 (Rel. 27, Created) O1-NOV-1997 (Rel. 35, Last sequence update) O1-NOV-1997 (Rel. 40, Last annotation update) Hypothetical lipoprotein ydek precursor (ORFT). YDEK OR ORFT OR B1510.
                                                                                                                                                                                     0.29;
                                                                                                                                                                                                               59; Mismatches
                                                                                                                                                                                                                                                                    1 TDETGLINVETEKLSFGANG-------
                                                                                                                                                               7.1%; Score 166;
                                                                                                                                                                                       Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Enterobacteriaceae; Escherichia.
       # > ♡ ♡
22.4%;
                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     751 IVSGTVGG 758
                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   439 IIKGTASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=562;
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          113 TYDTVEFLSADTKTTTVNVESKDNGKKTE-----VKIGAKTSVIKEKDGK-LVTGK-- 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            185 TTELFEIGSYGTGSLNIT----DKGYVTSSIVALLGYQAGSNGQVVVEKGGEWLIKNNDS 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59 --MLLNTG----ATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            136 NARPLNVGQSGTGTLNIKQKGHVDG-----GYLRLGSSTGGV--GTVNVEGEDSVL
                                                                                                                                                STRAIN=KI2;
ALDA H., Baba T., PubMed=9097039;
ALDA H., Baba T., Pujita K., Hayashi K., Inada T., Isono K., Itoh T.,
Kasai H., Rashimoto K., Kimura S., Kitakawa M., Kitagawa M.,
Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,
Makano S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T., Saito N.,
Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J.,
Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.,
Takemoto K., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.,
Takemoto R., Andra C., Yamamoto Y., Horiuchi T.,
Takemoto R., Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
Takemoto R., Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
Takemoto M., Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
Takemoto M., Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
Takeuchi Y., Mada C., Yamamoto Y., Horiuchi T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4 TGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGST--LTD---
                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 595-1325 FROM N.A.
MEDLINE-94100243; PubMed-8274505;
Cartwright P.J., Tinms M.W., Lithgow T., Hoej P.B., Hoogenraad N.J.;
"An Escherichia coli gene showing a potential ancestral relationship to the genes for the mitochondrial import site proteins ISP42 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -! - SUBCELLULAR LOCATION: Attached to the membrane by a lipid anchor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Potential).
-!- SIMILARITY: TO E.COLI YFAL.
-!- SIMILARITY: SONE, TO FUNCAL MITOCHONDRIAL IMPORT SITE PROTEINS ISP42 AND MOU38.
-!- CAUTION: REF.3 SEQUENCE DIFFERS FROM THAT SHOWN DUE TO A FRAMESHIFT IN POSITION 653.
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Dayls N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; DB 1; Length 1325;
0.26;
ches 218; Indels 117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19 19 N-ACYL DIGLYCERIDE (POTENTIAL).
884 884 N -> K (IN REF. 3).
1317 M -> S (IN REF. 3).
1325 AA; 136514 MW; 26A3A066FA19AD7D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HYPOTHETICAL LIPOPROTEIN YDEK
                                                                  "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EcoGene; EC11780; ydek.
PROSITE; PS00013; PROKAR_LIPOPROTEIN; 1.
Hypothetical protein; Membrane; Lipoprotein; Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7.0%; Score 165; DB 24.3%; Pred. No. 0.26 tive 54; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Biochim. Biophys. Acta 1153;345-347(1993)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL, D90793; BAA15190.1; ALT_INIT.
EMBL, D90794; BAA15197.1; ALT_INIT.
EMBL, X73295; CAA51730.1; ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AE000248; AAC74583.1; -.
                                                                                                                                                                                                                                                                                                                                                                      DNA Res. 3:363-377(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 125; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1325
1325
19
884
1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIR; A64905; A64905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Complete proteome.
                                                                                                                                 SEQUENCE FROM N.A.
                    Gregor J., Davis
Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   to the MOM38.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CHAIN
  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

```
262
                                                                                                                                                                                                                                                                                   365
                                                                                                                                                                                                                                                                                                                                                                                                                464 DGG--KFVSQNITFLGDKASGIGTLNLMDATSSFDTVGINVGNFGSGIVNVSNGATLNST 521
-----GKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGT 216
                                                                                                                                                                                        -----DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGN-----NIEITRNGKNIDIA 310
                                                                                                                                                                                                                                    350 YIGDAGDGELNVSSEGKVDSGIITAG----MKET---GTGNITVKDKNSVITNLGTNLLGYD 403
                                                                                                                                                                                                                                                                                                                               404 GHGEMNISNOGLVVSNGGSSLGYGETGVGNVSITTGGMWEVNKNVYTTIGVAGVGNLNIS 463
                                                                                                                                                                                                                                                                                                                                                                                NVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLP--GKSMMAIGGGTYLGEA 423
                             241 SIEFQIGNQCTGEATIREGGLVTAENTIIGGNATG----IGTLNVQ----DQDSVITVRR
                                                                                                                        293 LYNGYFGNG---TVNISNNGLINNKEYSLVGVQDGSHGVVNVTDKGHWNFLGTGEAFRYI
                                                                                                                                                                                                                                                                                311 TSMTPQFSSVSLGAGADAPTLSVDDEGALNV----GSKDANKPVRITNVAPGVKEGDVT
                                                                                          217 KVTFASGNGTTATVSKDDQGNITVK-YD-VNVGDALN--VNQLQNSGWNL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           124 GYAI-----GYSSISAGGNWIIKGTASGNSR 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          522 GYGFIGGNASGKGIVNISTDSLWNLK-TSSTNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               completed: October 6, 2003, 09:24:17
he: 10.1345 secs
163
                                                                                                                                                                                        263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Job time
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Search
                                         qq
                                                                                          Qγ
                                                                                                                             QQ
                                                                                                                                                                                     δ
                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
```

THIS PAGE BLANK (USPTO)

```
Ogaqfo neisseria m
Ogjoss neisseria m
Ogjos neisseria m
Ogjor neisseria m
Ogjos neisseria m
Ogjos neisseria m
Ogjos neisseria m
Ogjon neisseria m
Ogjos nemophilus
Oggm79 haemophilus
Oggm76 haemophilus
Oggm76 haemophilus
Oggm76 haemophilus
Oggm76 haemophilus
Oggm77 haemophilus
Oggm77 haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                 QBKqMB processing QBKqMB escherichia C9pd50 xylella fas Q9pc04 xylella fas Q8z164 salmonella Q8kqm9 moraxella c Q8fcb2 escherichia Q9f3x5 pasteurella Q9f3x5 pasteurella Q8ckm1 yersinia pe
                          Q9jr18 neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
    29jps7 neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157609; AAK68870.1;
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        093072;
01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2337; DB 2;
Pred. No. 2.7e-94;
0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                  Q9F3X6
Q8KQM8
Q8XDG4
Q9PD50
Q9PC04
Q8ZL64
Q8ZL64
                                         Q9AQF0
Q9JPS5
Q9JQW4
Q9JPR7
                                                                                                                             Q93QY1
Q9JPSB
Q9JPIO
Q9JPHO
P71401
Q8GM79
Q8GM74
Q8GM76
Q8GM76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                              Q8GM77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NhhA outer membrane protein.
NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 99.4
Best Local Similarity 99.8
Matches 460; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                 599
589
2353
2353
1096
1098
11210
11002
11002
11004
11004
                                                                                                                                                                                                                                                                                                                                                                                                      2314
1588
2059
1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A. STRAIN=H41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=487
2210.5
2210.5
2210.5
2216.5
2116
2119
2119
2114
2104
876
876
876
877
873.5
373.5
373.5
373.5
374.5
375.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377.3
377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      093QY2
    293QY2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                neisseria m
neisseria m
neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      093qy2 neisseria m
09jps9 neisseria m
                                                                                                                                                                       (without alignments)
3513.485 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                               6, 2003, 09:13:10 ; Search time 33.9322 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Description
                                                                                                                                                                                                                                                      2350
1 TDETGLINVETEKLSFGANG.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09jps2
09jps0
09jps0
09jpt0
09jpt8
09jpr8
09jpr9
09jps6
09jps4
09jps4
09jps4
09jps4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          09jps9
09jpi3
                      5.1.6
Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                  830525 segs, 258052604 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                        GenCore version (c) 1993 - 2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                         - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0930Y2
09JPS3
09JPS3
09JPS3
09JPS3
09JPR3
09JPR3
09JPR3
09JPR9
09JPS4
09JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q93QY4
Q93QY3
                                                                                                                                                                                                                                                                                                                    BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sp_archea:*
sp_bacteria:*
sp_fung!:*
sp_human:*
sp_nuvertebrate:*
sp_mammal:*
sp_mnc:*
sp_organelle:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sp_unclassified:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sp_plant:*
sp_rodent:*
sp_voirus:*
sp_vertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sp_archeap:*
                                                                                                                                                                                                                                   US-09-771-382-36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPTREMBL_23:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2337
2299
2299
2299
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
22280
2228
                                                                                                                                                                                                                                                         Perfect score:
                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                                                                               Seguence
                                                                                                                                                 Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Result
No.
```

ö

us-09-771-382-36.rspt

312 EVIDAVNKAGWRMKTTTANGOTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVM 242 YDVNVGDALNVNQLONSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT	KNGKNILLATISMIPQESSYSLGAGADAPTLSVDDEGALNVGSKDANKPYKITNVAFGKE 3 [422	RESULT 3 Q9JPI3 ID 09JPI3 PRELIMINARY; PRT; 594 AA.	AC 095913. DY 01-027-2000 (TREMBLE-1.15, Last sequence update) DY 01-027-2000 (TREMBLE-1.15, Last sequence update) DY 01-027-2000 (TREMBLE-1.22, Last sequence update) DE 01-027-2002 (TREMBLE-1.22, Last sequence update) DE 01-027-2002 (TREMBLE-1.22, Last sequence update) DE 01-027-2002 (TREMBLE-1.22, Last annotation update) CON MA992. ON MA992. ON MA992. ON MOBI_STAIDA-481. RA STAINA-N03788, and B2232; RA MEDIANE-20175756; bubbed-10710308; RA MATCH G., Santin L., Savino S., Searselli M., Storni E., Zuo P., RA A Galootti C.L., Luzzi E., Mancti R., Mason T., Tettelin H., RA MATCH G., Santin L., Savino S., Searselli M., Storni E., Zuo P., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATLI G., Santin L., Savino S., Searselli M., Storni E., RA RATAZIN L., Savino S., Searselli M., Storni E., So EQUENCE S., Santin L., Savino S., Searselli M., Storni E., So Edge C., Santin L., Savino S., Savino S., Savino S., Savino S.,
Db 252 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDECEGLVTAK 311 QY 182 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241	372 YDVNVGDALNYNQLANSGRALDSAANAUSSGRAYLSGRYSPSKAKAMDETVILAININININININININININININININININININI	362 GDVINVAQLKGVAQNLANRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMAIGGGTYLG 4	Qy 422 EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462 	PRESULT 2 10 09JP999 10 09JPP999 10 09JPPP999 10 09JPPPP999 10 09JPPPP999 10 09JPPPP999 10 09JPPPP999 10 09JPPPP999 10 09JPPPP999 10 09JPPPPP999 10 09JPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP

421

```
242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Nelsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF126381; AAF42530.1; -.
EMBL; AF157607; AAK68868.1; -.
InterPro; IPR00594; YadA.
Finan: PF03895; YadA.
SEQUENCE 598 AA; 62763 MW; E6C7AEF0BB8A63CB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGRNGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 DETGLINVETEKLSFGANGKKVNIÏSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pizza M., Scarlato V., Masignani V., Gluliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Santini E., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .;
0
                                                                                                                                                                                                                                                                                                                                                          01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992 (NhhA outer membrane protein).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
MenIngococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                         EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                     594
                                                                                                                                                                                Score 2261; DB 2;
Pred. No. 5.5e-91;
                                                                                                                                                                                                                                                                                                                     AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=NGH15;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNA992 OR NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-H15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria
                                                                                                                                                                                                     554
                                                                                                             484
                                                                                                                                                       422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                          .0Sdr60
                                                                                                                                                                                                                                                                                                                 Q9JPS0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                       RESULT
                                                                                                                                                                                                                                                                                                                                          ACCOOR SELECTION OF THE                                                                                                            qq
                                                                                                                                                       δ
                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
253
                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               302 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                              RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Moxon E.R., Grandi G., Rappuoli R.; Granoff D.M., Venter C., Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9; Indels
                                                                                                                                                                                                                                                                  62114 MW; 1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                                                             EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01ter membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97.0%; Score 2280; DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. 8.1e-92;
2; Mismatches 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AF226379; AAF42528.1; -. InterPro; IPR005594; Yada.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             450; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF03895; YadA; SEQUENCE 594 AA; (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-NGE31;
                                                                                                                                                  362
                                                                                                                                                                                              494
                                                                                                                                                                                                                                             422
                                                                                                                                                                                                                                                                                       554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local
                                                                                                                                                                                                                                                                                                                                                                                                    09JPS2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                        RESULT 4
                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                              à
                                                                                                      셤
                                                                                                                                                  ò
                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
```

ö

121 257 181

197

61

241

377

δ g

ò P g

δ

```
NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoll R.;
"Identification of Vaccine Candidates Against Serogroup B
Honingcoccus by Whole-Genome Sequencing.";
Science 287:1816-1820(2001)
REMBI. AF226359; AAF42508.1;
REMBI. AF2263895; Yadda;
Rem Interpro; IPRO05594; Yadd.
REMBI. PF03895; Yadda;
REMBI. SEQUENCE 598 AA; 62763 MW; 63A6A3BD7F0F2EE3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              258 ADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDVINVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLAQAYLPGKSMMAIGGGTYRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ó;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 598;
                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
00ter membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          96.2%; Score 2261; DB 2; 96.5%; Pred. No. 5.5e-91; iive 4; Mismatches 12;
                                                                                                                                                                                      598
                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 Similarity 445; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=2996;
  422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              198
                                                    558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                          QQ DPTO QQ DPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Op
     ŏ
                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                           GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                          557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADTRITTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PERVINEBLIO;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Pak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157603; AAK68864.1; -.
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA.
SEQUENCE 598 AA; 62687 MW; 18CEFFE6410A15DF CRC64;
                                                                                                                                                                                                                 2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 598;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tch 96.2%; Score 2261; DB 2; Length 5 al Similarity 96.5%; Pred. No. 5.5e-91; 445; Conservative 4; Mismatches 12; Indels
                                                                                                                                                                                                                                                                                                                       EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
NhhA outer membrane protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              [1]
SEQUENCE FROM N.A.
                                                                             302
                           378
                                                                                                                                 438
                                                                                                                                                                                   362
                                                                                                                                                                                                                                       498
                                                                                                                                                                                                                                                                                              422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               093QY5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                         093QY5
```

δ q οχ q ð g ò g δý g δ g ò g

ö

197

241 377 301

```
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Maxon E.K., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococus by Whole-Genome Sequencing.";
         01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer_membrane protein GNA992 (NhhA outer membrane protein).
                                                                                    Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 2260; DB 2;
Pred. No. 6.1e-91;
5; Mismatches 11
                                                                                                                                                             MEDLINE=20175756; Pubmed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96.2%;
96.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                 Neisseriaceae; Neisseria
                                                                      Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                          NCBI_TaxID=487;
                                                            GNA992 OR NHHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              445;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                        DETGLINVETEKLSFGANGKKVNIISDFKGLNFAKETAGTNGDFTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Companducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Mora M., Nuti S., Ratti G.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hoxdo D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                            0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                  Score 2260; DB 2; Length 590;
Pred. No. 6e-91;
3; Mismatches 12; Indels
                                                                                                                                  Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBL_TaxID-487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FAGYALGYSSISDGGNWIIKGTASGNSRGHFGASASVGYOW 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                           61661 MW; 8AA476AC300D80C8 CRC64;
                                                                      (TrEMBLrel. 15, Last sequence update) (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ¥.
                                                                                                                                                                                                                                                                                                                              Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    599
                                                           Created)
                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                 STRAIN=NGE28;
MEDLINE=20175756; PubMed=10710308;
                                                                                     Outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                   96.2%;
                                                         (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                     EMBL; AF226378; AAF42527.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                            446; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                  PRELIMINARY;
                                                                                                                          Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                         Pfam; PF03895; Yada;
SEOUENCE 590 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                        01-OCT-2000
01-OCT-2000
                                                                                  01-OCT-2002
                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   490
                                                                                                                                                                                                                                                                                                                                                                                                                    Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             422
                                             Q9JPS3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9JPR8
                                Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       09JPR8
ID 09
         RESULT
                      Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
```

ö 241 121 301 361 558 122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK 181 GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421 61 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK 2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL 62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE Gaps ; 0 Length 599;

```
62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     378 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GDVINVAQLKGVAQNLNNRIDNVDGNALAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRG
                                                                                                                                                                                                                                                                                                                                                                                 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Rati G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
B rocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.,
Identification of Vaccine Candidates Against Serogroup B
Rocker S. Mark 25311; -
EMBL, AF25382; AAF425311; -
R pfam: PF03895; Yada: 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 598;
                                                                                                                                                                                                                           GNA992..
busseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                        01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
   EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 2247; DB 2;
Pred. No. 2.2e-90;
2; Mismatches 15
                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                  STRAIN=NGH36;
MEDLINE=20175756; Pubmed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                95.68;
96.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best_Local Similarity 96.3
Matches 444; Conservative
                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                   NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             422
 422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                         09JPR9;
                                                                                                                       Q9JPR9
                                                                                      RESULT 11
                            q
                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226568; AAF42577.1;
EMBL; AF226558; AAF42577.1;
EMBL; AF226568; AAF42507.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                        Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Rati G., Santini L., Savino S., Scarselli M., Storni E., Zora Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Sanders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 594;
                                                                                                                     Outer membrane protein GNA992 (NhhA outer membrane protein).
                                                                                                                                                                    Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62361 MW; 436BDDED68263C5C CRC64;
                                                                                     Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 2247; DB 2;
Pred. No. 2.2e-90;
2; Mismatches 15;
                                    Ā
                                                                                                                                                                                                                                                                                                                                                                                                                                    Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                    Created)
                                  PRT;
                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
STRAIN=BZ198, and 297-0;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 95.68;
96.38;
                                                                 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2002 (TrEMBLrel. 22,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                        Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam; PF03895; YadA;
SEQUENCE 594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                    GNA992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-B2198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  444;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                  09JPH7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Loca
Matches
RESULT 10
Q9JPH7
```

ó

197

257

g

ö

셤

ð

g

οy

à qq 셤 ò 셤 õ

ò

181

241

437 361 497 421 557

```
PRT;
                                                                                                                                                                                                      MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5;
                                                                       Outer membrane protein GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
   PRELIMINARY;
                             01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-OCT-2002 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                    Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                              NCBI_TaxID=487;
                                                                                                                                                                                            STRAIN=NG6/88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          441;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JPS1
   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSAD 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEV 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRN 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGD 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4 TGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLLNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKDANKPVRITNVAPGVKEGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Comanducci M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Granoid G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 600;
                                                                                                                                                                           Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62762 MW; 36256963E0598CD1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                  01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
Outer_membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. 1.4e-89;
3; Mismatches 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94.8%; Score 2228.5;
                                                           009
                                                           PRT;
                                                                                                                                                                                                                                                 STRAIN=E26;
MEDLINE=20175756; Pubmed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL, AF226371; AAF4252011; -.
InterPro; IRRO05594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 600 AA; 62762 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity 96.3%;
Matches 442; Conservative
                                                          PRELIMINARY;
                                                                                                                                              GNA992.
Neisseria meningitidis.
                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                        NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           304
                                                        Q9JPS6
Q9JPS6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 13
Q9JPS4
                             RESULT 12
                                          09JPS6
```

qq

ò

셤

g ò g δ a ŏ

ò

ò

셤

g

```
126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67 DLTDLTSVETEKLSFGANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62 NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Maxon E.K., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";

Science 287:181-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 526;
                                                                                                                               Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL, AF226377; AAF42526.1; -.
InterPro; IPR005594; Yada.
Pfam; PF03895; Yada; 1.
SEQUENCE 526 AA; 54732 MW; F543C4234AF807CA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
(TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94.7%; Score 2224.5; DB: 95.7%; Pred. No. 1.8e-89;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9JPS1
Q9JPS1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             H H H
```

æ

```
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                  Query Match
                                                                                                                                                                             Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      time
                                                                                                                                                                                                                                                                                                                     qq
  g
                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                           Dp
                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              370
                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                               190
                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                         250
                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                    DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                         NTGATTNVTNDNVTDDEKKRAASVKDVLNAGWIIKGVKPGTTASDNVDFVRTYDTVEFLS
                                                                                                                                                                                                                                                                                                                                                                                                                   ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                             EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                   Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zov D., Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.;
                                                                                                                                                                                                                                                                                                           1;
                                                                                                                                                                                                                                                                                    94.7%; Score 2224.5; DB 2; Length 530; 95.7%; Pred. No. 1.8e-89; Live 5; Mismatches 14; Indels 1;
                                           Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                              55190 MW; 1F836CA57598515B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                         Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226380; AAF42529.1; -.
InterPro; IPR005594; Yada.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA
                                                                                               STRAIN=NGF26;
MEDLINE=20175756; PubMed=10710308;
01-OCT-2002 (TrEMBLrel. 22, La Outer membrane protein GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TrEMBLrel. 19, C
(TrEMBLrel. 19, L
(TrEMBLrel. 22, L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NhhA outer membrane protein
                              Neisseria meningitidis.
Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                        Matches 441; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis
                                                                                                                                                                                                                                                    PF03895; YadA;
                                                                                                                                                                                                                                                                530 AA;
                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-DEC-2001
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-OCT-2002
                                                                                                                                                                                                                                                                                                                               7
                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                              131
                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                      191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  430
                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           490
                                                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0930Y4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 15
Q93QY4
ö
                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ολ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
```

```
241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         493
                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                       Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157605; AAK68866.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2 DETGLINVETEKLSFGANGKKVNIISDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDMLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                            122 ADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242 YDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDVTNVAQLKGVAQNLNNRIDNVNGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYLG
                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                   ;
0
                                                                                                                                                                                                                                                594;
                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EAGYAIGYSSISAGGNWIIKGTASGNSRGHFGASASVGYQW 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9DDD48B04B3A8EA2 CRC64;
                                                                                                                                                                                                                                            94.2%; Score 2213; DB 2;
ilarity 95.0%; Pred. No. 6.7e-89;
Conservative 5; Mismatches 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6, 2003, 09:30:51
                                                                                                                                                                                         Pfam; PF03895; YadA; 1.
SEQUENCE 594 AA; 62297 MW;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Search completed: October
                                                                                                                                                                                                                                                               Local Similarity
es 438, Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       : 34.9322 secs
                                                   FROM N.A.
                                                   SEQUENCE FRO
STRAIN-EG327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               422
```

ö

BASB029 amino acid

```
25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                            581.5
569
412.5
412.5
339
331.5
331.5
325
325
312.5
                                                                                                                                                                                                                                                                                                                                                                                                                           600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAU06184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAU06184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N. meningitidis PM
N. meningitidis PM
N. meningitidis PM
Amino acid sequenc
A surface protein
A surface protein
N. meningitidis EG
N. meningitidis EG
N. meningitidis EG
                                                                                                              2003, 09:05:45; Search time 30.5718 Seconds (without alignments) 1848.329 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A. Calinsky 150 units :

2. SIDSI/gcddata/geneseq/geneseqp-embl/AA1980 DAT:*

3. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

3. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

3. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

5. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

5. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

6. SIDSI/gcddata/geneseq/geneseqp-embl/AA1981 DAT:*

7. SIDSI/gcddata/geneseq/geneseqp-embl/AA1980 DAT:*

8. SIDSI/gcddata/geneseq/geneseqp-embl/AA1980 DAT:*

10. SIDSI/gcddata/geneseq/geneseqp-embl/AA1991 DAT:*

11. SIDSI/gcddata/geneseq/geneseqp-embl/AA1991 DAT:*

12. SIDSI/gcddata/geneseq/geneseqp-embl/AA1991 DAT:*

13. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

14. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

15. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

16. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

17. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

18. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

19. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

20. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

21. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

22. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

23. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

24. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

25. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

27. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

28. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

29. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

21. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

22. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

23. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

24. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

25. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

26. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

27. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*

28. SIDSI/gcgdata/geneseq/geneseqp-embl/AA1991 DAT:*
                                                                                                                                                                                              US-09-771-382-37
1813
1 NNVDFVRTYDTVEFLSADTK.....TASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /SIDS1/gcgdata/geneseq/geneseqp-embl/AA2003.DAT
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                          1107863 seqs, 158726573 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAU06185
AAU06182
AAY27202
AAY23741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY23746
AAU06171
AAU06175
AAU06186
                                                                             - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU06184
                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A_Geneseq_19Jun03:*
                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 407
433
512
591
591
591
591
591
                                                                                                                   9
                                                                                                                   October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7.999
7.999
7.999
7.999
7.999
7.999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               100.0
99.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1808
1808
1808
1808
1808
1808
1808
                                                                                                                                                                                                                   Perfect score:
                                                                                                                                                                                                                                                                                 Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
                                                                             OM protein
                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                          Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                   Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š.
```

```
A surface protein
BASBO29 amino acid
N. meningitidis EG
N. meningitidis 22
A surface protein
A surface protein
N. meningitidis B3
Amino acid sequenc
N. meningitidis B4
A surface protein
N. meningitidis B1
N. meningitidis B2
A surface protein
N. meningitidis B2
N. meningitidis B4
Haemophilus adhesi
Haemophilus adhesi
Haemophilus adhesi
Haemophilus influe
Haemophilus influe
Haemophilus influe
Haemophilus influe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Escherichia coli p
M. catarrhalis sur
M. catarrhalis les
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Haemophilus influe
Haemophilus influe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Haemophilus influe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Haemophilus influe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Surface antigen NhhA; meningococcal disease; meningitis vaccine; mutant; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1..51
/label= Signal_peptide
52..407
/label= Wature_NhhA_deletion_mutant_#2
/note= "Predicted mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N. meningitidis PMC21 NhhA deletion mutant #2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAB23855
AAB37830
AAB23857
AAB23854
AAB23856
                                                                  AAU06174
AAU06180
AAY23743
AAU06176
AAU06179
AAU06183
AAY23744
AAU06183
                                                                                                                                                                                                                                               AAY23738
AAY23742
AAU06177
AAU06178
AAY23745
AAU06173
                                                                                                                                                                                                                                                                                                                                                                                                             AAB23858
AAR99393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAB23859
ABB52677
ABP71294
                                                                                                                                                                                                                                                                                                                                                                            AAR99392
                                                                                                                                                                                                                                                                                                                                                                                              AAB37832
                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAB23860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAB69136
                                                                                                                                                                                                                                                                                                                                                           AAU06181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAR99394
                                                  AAY57044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis strain PMC21. Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAU06184 standard; Protein; 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-OCT-2001 (first entry)
2411
679
679
72
1004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1002
WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           02-AUG-2001
                1804
1753.5
1753.5
1753.5
1752.5
1748.5
1748.5
1748.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1758.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759.5
1759
```

Mon Oct

```
Location/Qualifiers
                                                                                                                                                                                                                  N-PSDB; AAS09175
                                                                                  WO200155182-A1.
                                                                                                                                                                                     Peak IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                    Seguence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
           Peptide
                               Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Loc
Matches
  Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δy
                                                                                                                                                                                                                                                                                                            ô
                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                    111
                                                                                                                                                                                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                351
                                                                                                                                                                                                                                                                                                                               9
                                                                                                                              The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh (AAU06186). The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhA deletion mutant #2.
                                                                                                                                                                                                                                                                                                                                          NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                       ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                             TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                     MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                  tidis, useful in producing vaccines for treating or spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface antigen NhhA; meningococcal disease; meningitis vaccine;
                                                                                                                                                                                                                                                                                                           ;
                                                                      New NhhA surface antigen polypeptides and polynucleotides from
                                                                                                                                                                                                                                                                                      100.0%; Score 1813; DB 22; Length 407; 100.0%; Pred. No. 9.1e-118; ive 0; Mismatches 0; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N. meningitidis PMC21 NhhA deletion mutant #3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis strain PMC21.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAU06185 standard; Protein; 433
                                                                                                            Claim 12; Fig 7; 91pp; English.
                                                                                  Neisseria meningitidis, useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                               Local Similaring hes 356; Conservative
(UYQU ) UNIV QUEENSLAND
                    Jennings
                                       2001-488774/53
                                                                                                                                                                                                                                                                  407 AA;
                                       WPI; 2001-488774/
N-PSDB; AAS09174.
                                                                                           preventing broad
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mutant; mutein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-OCT-2001
                    Peak IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Synthetic
                                                                                                                                                                                                                                                                                                                              Н
                                                                                                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       352
                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                 52
                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                         112
                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAU06185;
                                                                                                                                                                                                                                                                                                  Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAU06185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
q
                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    å
                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
```

```
300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 433;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 1808; DB 22;
Pred. No. 2.2e-117;
l; Mismatches 0;
/label= Signal_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 12; Fig 8; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99.78;
                                                                                                                                                                                                                                                     25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                        25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                          (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                               Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
355; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            433 AA;
```

ö

```
61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                      241 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The invention provides proteins (AAY27201-245) from Neisseria meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also bacteria, especially Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                               PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                  Neisseria meningitidis protein; pharmaceutical; vaccine; diagnosis; bacterial infection; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisseria meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scarlato V;
                                                                                                                                                                                                                                                                                                                                                                                                                               Amino acid sequence of N. meningitidis protein ORF40-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 1808; DB 20;
Pred. No. 3.2e-117;
Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rappuoli R,
                                                                                                                                                                                                                                                                                                                         Ā
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pizza M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Page 62; 123pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1;
                                                                                                                                                                                                                                                                                                                       AAY27202 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99.7%;
99.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99WO-IB00103
                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Grandi G, Masignani V,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1999-444400/37.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity
Matches 355; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (CHIR-) CHIRON SPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-PSDB; AAX99124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                            24-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-JAN-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          22-JUL-1999
                                                                                    337
                                                   181
                                                                                                                                                           397
                                                                                                                                                                                              301
                                                                                                                                                                                                                               457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                       AAY27202
                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                       QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                   ŏ
                                                                                    8
                                                                                                                       δ
                                                                                                                                                                                              ò
                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh AMUGAUGARDS AAUGGIBS6). The modified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in adjanostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis \cdot
                                                                                                                                                                           Surface antigen NhhA; meningococcal disease; meningitis vaccine;
                                                                                                                                                                                                                                                                                                         1..31
/label= Signal_peptide
52..512
/label= Mature_Nhha_deletion_mutant_#1
/note= "Predicted mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 512;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1808; DB 22;
Pred. No. 2.7e-117;
1; Mismatches 0;
                                                                                                                                        meningitidis PMC21 NhhA deletion mutant #1.
                                                                                                                                                                                                                       Neisseria meningitidis strain PMC21.
Synthetic.
                                                                                                                                                                                                                                                                                   Location/Qualifiers
                               AAU06182 standard; Protein; 512 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 12; Fig 5; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99.7%;
99.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25-JAN-2000; 2000US-0177917
                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        al Similarity 99.7
355; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    512 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAS09172.
                                                                                                                                                                                               mutant; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                             WO200155182-A1
                                                                                                     24 -OCT - 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Peak IRA,
                                                                    AAU06182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local
Matches 35
                                                                                                                                                                                                                                                                                                   Peptide
                                                                                                                                                                                                                                                                                                                                      Protein
              AAU0618;
RESULT
```

ö

g ð

δ g ò

```
TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                    MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                        NKPVRITINVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                 NKPVRITHNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                              The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis surface proteins useful for treating N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 1; Page 127-128; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                   Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak
                                                                                                                                                                                                                                                                                                                                                                                  AAY23746 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             97GB-0026398.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               immunoreactive peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Moxon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 1999-418754/35.
N-PSDB; AAX85798.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AIND ( DÖXD)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                         08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24-JUN-1999
                                                                                                                                                                                                                                                   476
                                                                                                                                                                                         416
                                                                                                                                                              181
                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                              AAY23746;
                                           61
                                                                                                   121
                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                      RESULT 6
                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                      qq
                                                                                                   ŏ
                                                                                                                                q
                                                                                                                                                              ŏ
                                                                                                                                                                                        g
                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                               Qγ
                                                                                                   240
                                                                                                                                475
                                                                                                                                                              300
                                           180
                                                                                                                                                                            MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                             NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to lengthiy immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisserla meningitidis surface proteins useful for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                        Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 1808; DB 20;
Pred. No. 3.2e-117;
: Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                           A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 1; Page 104-106; 132pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Peak IRA;
                                                                                                                                                                                                                                                                                                                        AAY23741 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INNOVATION LTD.
                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          355; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 1999-418754/35.
N-PSDB; AAX85793.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SISI (-SISI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AIND ( DŌAD)
                                                                                                                                                                                                                                                                                                                                                                               08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24-JUN-1999,
                                                                                                                                                                                                                                                                                                                                                   AAY23741;
                                                                     356
                                                                                                   181
                                                                                                                              416
                                                                                                                                                                                      476
                                          121
                                                                                                                                                             241
                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Loca
Matches
```

AAY2374 RESULT

g

g ò g ŏ q

ð g

ò

DB 20; Length 591;

Score 1808;

99.78;

Query Match

9

NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG

ò

```
02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                              Query Match
 Region
                                                                                                                                                                                                                                                                                      Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 8
AAU06175
 ò
                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                             QΩ
                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                          ΩD
                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
      ö
                                                                                               ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                       TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                          NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                  NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                    PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                          Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                                                                                                                                                                                       N. meningitidis PMC21 surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                                                                                                    /label= Mature_NhA
/label= Mature_NhA
/note= "Predicted mature protein, specifically
claimed in claim 12"
      Indels
      ;
0
Pred. No. 3.2e-117; Mismatches 0;
                                                                                                                                                                                                                                                                                                 l..50
/label= C1
/note= "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                   "Conserved region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V4
/note= "Variable region 4"
                                                                                                                                                                                                                                                                                                                                 "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                          /label= V2
/note= "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                      'note= "Variable region 3"
                                                                                                                                                                                                                                                                                                                                                                      /label= C2
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                          'note= "Conserved region
                                                                                                                                                                                                                                                                                    1..51
/label= Signal_peptide
                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                Veisseria meningitidis strain PMC21
                                                                                                                                                                                                  Š
                                                                                                                                                                                                AAU06171 standard; Protein; 591
99.78;
                                                                                                                                                                                                                                                                                                                         /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                              /label= C3
                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= v3
                                                                                                                                                                                                                                                                                                                                                                                                                                                   'label= C4
                                                                                                                                                                                                                          (first entry)
      Conservative
                                                                                                                                                                                                                                                                                                                                                                                    .124
                                                                                                                                                                                                                                                                                                                                                                                                      .188
                                                                                                                                                                                                                                                                                                                                                                                                                                              . 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 236
                                                                                                                                                                                                                                                                                                                    51,.108
                                                                                                                                                                                                                                                                                                                                  /note=
Local Similarity
                                                                                                                                                                                                                         24-OCT-2001
                                                                                                                                                                                                             AAU06171;
                                            61
                                                         962
                                                                                  356
                                                                                                181
                                                                                                                                                   301
                                                                                                                                                                                                                                                                                   Peptide
                                                                                                                                                                                                                                                                                                                                       Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                   RESULT 7
                                                        셤
                                                                                 g
                                                                                               ò
                                                                                                            a
                                                                                                                                    g
                                                                                                                                                                g
                                                                                                                                                                                                a
                                            ò
                                                                      õ
                                                                                                                         à
                                                                                                                                                   å
```

```
180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     meningticidis mutant polypeptides of the surface antigen Nhha haracterised by deletions of non-conserved amino acids, particularly the addeditions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain PMC21 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present invention relates to the isolation of novel Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1808; DB 22
Pred. No. 3.2e-117
1; Mismatches 0
                                                               5
237..591
/label= C5
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99.78;
                                                                                                                                                                                                                                                                                                 25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                        25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                   Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2001-488774/53.
N-PSDB; AAS09161.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
nes 355; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          591 AA;
                                                                                                                     WO200155182-A1
```

ö

ဖ

```
from N. meningitidis strain EG329 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis strain PMC21
Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Æ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU06186 standard; Protein; 502
                                                                                                              99.7%;
99.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                  al Similarity 99.7
355; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak IRA, Jennings MP;
                                      the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 2001-488774/53.
N-PSDB; AAS09176.
                                                                           591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mutant; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24 -OCT - 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    02-AUG-2001
                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                     596
                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06186;
                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                      416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                  Query Match
                                                                                                                                  Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Key
Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein
                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAU06186
     222233
                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOX Y 
                                                                                                                                                                                            ð
                                                                                                                                                                                                                                                                Óγ
                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhha (AAU06186). The medified or mutant Nhha polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                              N. meningitidis EG329 surface antigen NhhA polypeptide sequence
                                                                                                                                                   Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                                                                                                                                                                                                                                                                                     09.120
1abel= C2
note= "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= C4
/note= "Conserved region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           237..591
/label- C5
/note= "Conserved region 5"
                                                                                                                                                                                                                                                                                 "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                    5
                                                                                                                                                                                                                                                                                                                    /label= V1
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                            121..124
| 1abel = V2
| note = "Variable region"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      189..210
/label= V3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     230..236
/label= v4
/note= "Variable region
                                                                                                                                                                                        Neisseria meningitidis strain EG329
                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  125..188
/label= C3
/note= "Conserved
AAU06175 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                              1..50
/label= C1
                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     111..229
                                                                                                                                                                                                                                                                                                   ..108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                     'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 2001-488774/53.
N-PSDB; AAS09165.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WO200155182-A1
                                                                         24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02-AUG-2001
                                    AAU06175
                                                                                                                                                                                                                             Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
```

```
ö
                                                                                                   ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                             TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                      MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                              1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                             PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Surface antigen NhhA; meningococcal disease; meningitis vaccine;
                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= Signal_peptide
50..502
/label= Mature_Nhha_deletion_mutant_#4
/note= "predicted mature protein, specifically
claimed in claim 12"
Length 591;
                                         Indels
 Score 1808; DB 22;
Pred. No. 3.2e-117;
1; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N. meningitidis PMC21 NhhA deletion mutant #4.
```

```
Misc-difference 108
                                                                                                                                                                                                                                                   Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  447
                                                                                                                                                                                                                                                                                                                                                                      207
                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                        267
                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLP 301
                                                                                   The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA MANU6186. The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                                                                                                                                                            NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                                                       TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                               DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   or
                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
          New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASB029 amino acid sequence from N. meningitidis strain H44/76.
                                                                                                                                                                                                                                                                                      Length 502;
                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                      Score 1807; DB 22;
Pred. No. 3.1e-117;
                                                                                                                                                                                                                                                                             99.7%; Scor.
100.0%; Pred. No. 3...
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Encoded by AAC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Encoded by AAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY57045 standard; Protein; 591 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Encoded by
                                                             Claim 12; Fig 9; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis
                                                                                                                                                                                                                                                                                                 Local Similarity
mes 355; Conserv
                                                                                                                                                                                                                                                              502 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21-FEB-2000
                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                         ~
                                                                                                                                                                                                                                                                                                                                                                                                                       802
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY57045;
                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAY57045
```

ð g õ g ò 쉽 ò g δý g ò

```
serogroup B strain H44/76. The BASB029 protein is homologous to the Haemologous to the Haemologous influence as experiences (HAZ) protein. The invention relates to BASB029 polynucleotide sequences (HAZ)9664-Z)9865) and polypeptide sequences (HAZ)044-Y57045) and their immunogenic fragments. BASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029 polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimmlation of the immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296 ENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This is the Nisseria meningitidis BASB029 amino acid sequence from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 1805; DB 21;
Pred. No. 5.1e-117;
2; Mismatches 0;
'note= "Encoded by AATC"
                                                                                                                                                                                          _LESO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                           ρλ
                                                                                                                       рy
                                                                                                                                                                                      /note= "Encoded by
                                                               "Encoded
                                                                                                                          "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99.68;
99.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                               98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity 99.4
Matches 354; Conservative
                                                                                                                          /note=
389
                                                               /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  receiving the protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 2000-053103/04.
                                                                                         Misc-difference 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB; AAZ39865
                             Misc-difference
                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                         WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                               13-MAY-1998;
                                                                                                                                                                                                                                                                                                                        18-NOV-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Seguence
```

ö

295

355 180 415 240

合 ò g

```
476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     357
                                                                        NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
  ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                          PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                    1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 20; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1753.5; DB 20
Pred. No. 1.9e-113;
4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 1; Page 100-101; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                  AAY23740 standard; Protein; 594 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        96.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             97GB-0026398.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity 97.2
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1999-418754/35.
N-PSDB; AAX85792.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WO9931132-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24-JUN-1999
                         417
                                                                                                                      477
                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Seguence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                        241
                                                                                                                                                                                                                      537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                   RESULT 12
                                                                                                                                                                                                                                                                                                                          AAY23740
                                                                                                                                                                                                                                                                                                                                                                                                   NAME OF THE PROPERTY OF THE PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                        Qγ
                                                                                                                         a
                                                                                                                                                                     Qγ
                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ö
                         535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                        PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ;
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                            Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1804; DB 20;
Pred. No. 6.1e-117;
!; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                A surface protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 1; Page 86-87; 132pp; English.
                                                                                                                                                                                                                                                  Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak IRA;
                                                                                                                                                                                                                                                AAY23737 standard; Protein; 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-418754/35.
N-PSDB; AAX85788.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                               08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Sim
Matches 354;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -
                       476
                                                                        301
                                                                                                                    536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                              AAY23737;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                      AAY2373
                                                                                                                                                                                                 RESULT
```

1;

297

q

g φ

ö

q

ò

à

.09

```
This is the Nisseria meningitidis BASB029 amino acid sequence from serogroup B strain ATCC13090. The BASB029 protein is homologous to the Haemophilus influences extracted fibril (HSF) protein. The invention relates to BASB029 polynucleotide sequences (AAZ39864-Z39865) and polypeptide sequences (AAZ5044-Y57045) and their immunogenic fragments. BASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a memmal. Compositions containing BASB029 polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 polynucleotides and polypeptides are also useful for treating infections particularly bacterial infections. The protein is useful in the screening and development of antibacterial drugs. Fused recombinant
MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                DNKPVRITHVAPGVKEGDVTHVAQLKGVAQHLHNRIDHVDGHARAGIAQAIATAGLVQAY 299
                                                                                                                                 BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                               BASB029 amino acid sequence from N. meningitidis strain ATCC13090.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note= "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                   ż
                                                                                                                                                                                                                                                                                             AAY57044 standard; Protein; 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98GB-0010276
                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Weisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2000-053103/04.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAZ39864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO9958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                J7-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                              21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ruelle J;
                                                                                                                                                                                                                                                                                                                              AAY57044;
                                                                                                                  240
                                                                                                                                              478
                 358
                                                 181
                                                                                                                                                                               300
                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                  AAY5704
                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                             ò
                                                                                                                                                                                                        8
                 ద
                                                                          8
                                                                                                              ò
                                                 ò
```

```
ä
                                                                                                                                                           180
                                                                                                                       120
                                                                                                                                        357
                                                                                                                                                                      181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                           240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
protein is useful for the stimulation of the immune system of an organism
                                                                                                    297
                                                                                                                                                                                                                                              09
                                                                                                                                                                                                                                                                            LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYOW 356
                                                                                           TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                  1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                       ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                Gaps
                                                                                                                                                                                                                                                                                    N. meningitidis EG327 surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                      Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                1;
                                               Length 594;
                                                                5; Indels
                                              21;
                                            Score 1753.5; DB 21
Pred. No. 1.9e-113;
; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1..50
/label= Cl
/^are= "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ٦,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <u>*</u>2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <u>-</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Variable region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= C2
/note= "Conserved region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "Variable region
105.116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117.126
/label= V2
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= V3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                      Weisseria meningitidis strain EG327
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                            AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Conserved
                                                                .,
                                                                                                                                                                                                                                                                                                                                           AAU06174 standard; Protein; 594
                                             96.78;
97.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= V1
                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V4
                                             Query Match 96.7
Best Local Similarity 97.2
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91..212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   232..238
        receiving the protein.
                          594 AA;
                                                                                                                                                                                                                                                                                                                                                                                24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                             AAU06174;
                            Sequence
                                                                                                     238
                                                                                                                       61
                                                                                                                                                            121
                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                             538
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          leg ion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             egion
                                                                                                                                                                                                                                                                                                                         RESULT 14
                                                                                                                                                                                                                                                                                                                                  AAU0617
2228
                                                                                                    g
                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                      ò
                                                                                                                                                           δý
                                                                                                                                                                            g
                                                                                                                                                                                              δ
                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                           g
```

(first entry)

```
AAU06180 standard; Protein; 592 AA.
                                                     24-0CT-2001
                          AAU06180;
                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                                     Region
                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                          Region
  ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             478 ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNHIDNVDGNARAGIAQAIATAGLVQAY 537
                                                                                                                                                                                                                                                                                                                                    The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh AAMUGAIS2-AAWUGAIS6). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain E3327 is 1 of 10 NhhA polypeptide sequences (AAWUGAIT-AAUGGIRO) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or
                                                                                                                                                                                                                                                          New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 22; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1753.5; DB 22; Lengt
Pred. No. 1.9e-113;
1; Mismatches 5; Indels
239..594
/label= C5
/note= "Conserved region 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4;
                                                                                                                                                                                                                                                                                                               Claim 9; Fig 1; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96.7%;
97.2%;
                                                                                                                                    25-JAN-2000; 2000US-0177917.
                                                                                                        25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                              (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                        Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the present invention.
                                                                                                                                                                                                                  WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              594 AA;
                                                                                                                                                                                                                                  N-PSDB; AAS09164.
                                                    WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Sim
Matches 347;
                                                                              02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
  Region
```

셤

à

g

ò

a

à

g

ò

g à

ò

RESULT 15 AAU06180

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh. (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the present sequence representing the wild type surface antigen NhhA
N. meningitidis Z2491 surface antigen NhhA polypeptide sequence.
                                                   Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C4
/note= "Conserved region 4"
                                                                                                                                                                                                                                     "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= C3
/note= "Conserved region 3"
                                                                                                                                                                                                                                                                                                                                                                                          "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Conserved region 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4
                                                                                                                                                                                                                                                                                                              "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= V2
/note= "Variable region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= V4
/note= "Variable region
                                                                                                      Neisseria meningitidis strain Z2491
                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                       103..114
/label= C2
                                                                                                                                                                                     1..50
/label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /label= C5
                                                                                                                                                                                                                                                                                      /label= V1
                                                                                                                                                                                                                                                                                                                                                                                                                     .124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          . 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . 227
                                                                                                                                                                                                                                                        ..102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                      /note=
                                                                                                                                                                                                                                           'note=
                                                                                                                                                                                                                                                                                                                                                                                               /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Jennings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 2001-488774/53.
N-PSDB; AAS09170.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200155182-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak IRA,
                                                                                                                                                          Key
Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
```

```
237 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLYTGKGKGE 296
                                                                                                                                              62 NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT 121
                                                                                                                                                                     356
                                                                                                          61
from N. meningitidis strain 22491 is 1 of 10 NhAA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in the present invention.
                                                                                                                                                           2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                     1;
                                                                DB 22; Length 592;
                                                                                     5; Indels
                                                                Score 1752.5; DB 2;
Pred. No. 2.2e-113;
                                                                                     Mismatches
                                                              Query Match 96.7%;
Best Local Similarity 97.5%;
Matches 347; Conservative
                                            592 AA;
                                             Sednence
                                                                                                                                                                    297
                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                             qq
   ប្តស្តប្តង្គន្ធ
                                                                                                          δ
                                                                                                                           q
                                                                                                                                               ŏ
                                                                                                                                                                   q
                                                                                                                                                                                                           g
                                                                                                                                                                                                                                  ò
                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                           ò
```

Search completed: October 6, 2003, 09:22:43 Job time : 31.5718 secs

THIS PAGE BLANK (USPTO)

```
181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NKPVRITHNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Appl
Appl
Appli
Appli
                                                                                                                                                                                                                ; Search time 9.52015 Seconds (without alignments) 1582.188 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 11,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sednence sed
                                                                                                                                                                                                                                                                                                                                                                                                                                 1 NNVDFVRTYDTVEFLSADTK.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    328717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Issued_Patents_AA:*
: /cgn2_6/ptodata/1/iaa/5A_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/6A_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/PcTuS_COMB.pep:*
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-377-155-11

US-09-669-974-11

US-09-669-974-21

US-09-669-974-2

US-09-377-155-2

US-09-377-155-2

US-09-669-974-9

US-09-669-974-15

US-09-669-974-17

US-09-669-974-17

US-09-377-155-17

US-09-669-974-17

US-09-669-974-17

US-09-669-974-17

US-09-669-974-13

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            328717 seqs, 42310858 residues
                                                                                                                                                                                                                2003, 09:14:45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                 us-09-771-382-37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                        ý
                                                                                                                                                                                                                        October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \begin{array}{c} \mathbf{Q} \ \mathbf{
                                                                                                                                                                                                                                                                                                                                                             Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Minimum DB &
Maximum DB &
                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                        Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
```

			0;	60 295	20	15
Application of the control of the co			S		3KG 1	GK 1
22232777777777777777777777777777777777			Gap:	TGKI 	FASC FASC	SPSK
			0;	KI LV	N - N	GNZ GNZ GNZ
sedneuce			591;	EKDG 	rsg1	XVIS
, , , , , , , , , , , , , , , , , , ,			ro.	VIK VIK	ETV	SSGI
			Length Indel	AKTS	ADKF	AVAG
			0;;	7K I G	11G0	DSK III
220000 22000 22000 2400 2400 2400 2400			1.	KTEV - - KTEV	ANGC	SWNI SWNI
24 24 24 24 24 24 24 24 24 24 24 24 24 2	TS	X	3.8e-	NGK 		SNO
- 2013.94 - 2013.94 - 313.74 - 2013.94 - 2013.96 - 2013.96	ALIGNMENT	m ANTIGEN 77,155 701031 98.2	ore 1808; ed. No. 3.8 Mismatches	ESKI - - ESKI	WRMK 	IONA IONA
000000000000000000000000000000000000000	LIG	55 elm 1 7377,7 7377,5 6398.3	Score Pred. 1	VNV 	JKAG 	DALN - DALN
	74	09377155 rd Anselm el Paul rd SURFACE A 8 08/09/37 08/19 114 cl 14 0	SCC Pre 1;	KTT7 	DAV!	NVGI - - NVGI
		E E E E E E E E E E E E E E E E E E E	.; se	NNVDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 	ENGSSTDEGEGLVTAKEVIDAVNKAGNRMKTTTANGGTGQADKEETVTSGTNVTFASGKG 	TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
658 1094 1094 2353 2353 2411 1912 1912 607 607 679 11002		Gequence 11, Application US/09: acquence 11, Application US/09: APPLICANT: PEAK, IAN Richard APPLICANT: JENKINGS, Michael APPLICANT: JENKINGS, Michael APPLICANT: DENK, IAN RICHARD TITLE OF INVENTION: E Richard TITLE OF INVENTION: E Richard CURRENT APPLICATION NUMBER: 1999-08 PRIOR FILING DATE: 1999-08 PRIOR FILING DATE: 1997-12-1 NUMBER OF SEQ ID NOS: 33 ESQ ID NO 11 LENGTH: 591 TYPE: PRIOR TERMING DATE: 1997-12-1 TYPE: PRIOR FILING DATE: 1997-12-1 TYPE: PRIOR PRIOR DATE: 1997-12-1 TYPE: PRIOR FILING DATE: 1997-12-1 TYPE: PRIOR PRIOR DATE: 1997-12-1 ONG ONG NING DATE: 1997-12-1	99.7%; ilarity 99.7%; Conservative	EFLS EFLS	VTA	Y II
22333000000000000000000000000000000000		Eion R. M.	y rvat	YDTV YDTV	BEGL BEGL BEGL	N D O C
		icai 2 2 2 2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	rit	VRT	TDE TDE	SKDI
188222222222222222222222222222222222222		SULT 1 Sequence 11, Application Patent No. 6197312 GEMERAL INFORMATION: GEMERAL INFORMATION: APPLICANT: PERATION: TITLE OF INVENTION: OF TITLE OF INVENTION: NOW FILE REFERENCE: 065064/CURRENT APPLICATION NUMBER APPLICATION DATE: 1998 PRIOR FILING DATE: 1998 PRIOR FILING DATE: 1998 PRIOR APPLICATION NUMBER PRIOR APPLICATION NUMBER PRIOR APPLICATION NUMBER PRIOR FILING DATE: 1998 NUMBER OF SEQ ID NOS: 3 SOFTWARE: PATENTIN OFF. LENGTH: 591 LENGTH: 591 TYPE: PRI ORGANISM: Neisseria men- 1998-377-155-11	similarity 55; Conserv	NVDF 	NGSS NGSS	ratv ratv
00.0000 .44		11, 619 11, 619 11, 619 11: P 11: M 11: M 11: M 11: M 11: M 11: M 11: M 11: M 12: M 13: M 14: M 15: M 16: M 17: M 18:	th Str 155;	1 NI : 36 DI	н 9	- 4
8 1.10 8 1.10		T 1 U-377-155- U-000C 11, ERAL INFO PLICANT: PLICANT: PLICANT: PLICANT: PLICANT: PLICANT: IC	Matcl Local	23	29	35
000108450¢80010845		SULT 1 SOULT 1 SOUGH 27 - 155 SOGGHOCO IN INF SEMERAL INF SEMERAL INF SEMERAL INF APPLICANT: APPLICANT: APPLICANT: APPLICANT: FILLE REFER	Query Match Best Local Matches 35			
1 (N (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		on contract on the	Que Bes Mat	ν Ω	ъ д	× Ω
		N N N N N N N N N N N N N N N N N N N		QY Dp	QA	da Oy

240

us-09-771-382-37.rai

셤

```
ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                    TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       356 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236 DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                             1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                            Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 591;
                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                          Score 1808; DB 4;
Pred. No. 3.8e-141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 1808; DB 4;
Pred. No. 3.8e-141;
1; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
ITTLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                 1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 21, Application US/09669974 Patent No. 6333173
                                                                                                                        ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; ORGANISM: Neisseria meningitidis US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99.78;
99.78;
                                                                                                                                                                                          99.78;
99.78;
    PRIOR FILING DATE: 1997-12-12
                        NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 11
LENGTH: 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 99.7'
Matches 355; Conservative
                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                         al Similarity
355; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-669-974-21
                                                                                                                                                US-09-669-974-11
                                                                                                                                                                                          Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                         TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: PRT
                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                     Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ōλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKITTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301 PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99.7%; Score 1808; DB 3;
99.7%; Pred. No. 3.8e-141;
11ve 1; Mismatches 0;
                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: MOXON, E. Richard FILL OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
NUMBER OF SEQ ID NOS: 33
SEQTWARE: PALENTIN Ver. 2.0
SEQ ID NO 21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INC. 1931/31;
GENERAL INC. 1931/31;
GENERAL INCORNATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: BENINGS, Michael Paul
SPELICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR PLILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR PLILING DATE: 1998-12-14
                                                                                                  Sequence 21, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 11, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity 99.79
Matches 355; Conservative
                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Ne
US-09-377-155-21
                                                                                 US-09-377-155-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-669-974-11
536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
```

ò g δλ qq g

Qγ

ò q

셤

ò

g

Qγ

ö

Gaps

```
US-09-377-155-9
                                                                                                                                                                                                                                         PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                        SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                      NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1804; DB 3;
Pred. No. 8.1e-141;
1; Mismatches 1;
                                                                                                                                                                                                                                                                         APPLICANT: PERK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MONZON, E. Richard
TITLE OF INVENTION: NOVEL SUFFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: 05/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATCHIN VET. 2.0
                                                                                                                                                                                                                                           Sequence 2, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 99.4%;
Matches 354; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 592
TYPE: PRT
                                                                                                                                                                                                                                 US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  us-09-377-155-2
                                                                                                                      241
                                                                                                                                          476
                               121
                                                                         181
                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                       SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                   g
                                                                         ò
                                                                                              q
                                                                                                                                       qq
                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                               à
                                                                                                                     δ
```

```
120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237 DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKLVTGKDKG 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 1804; DB 4;
Pred. No. 8.1e-141;
1; Mismatches 1;
                                                                      APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard
APPLICANT: DENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, MICHAEL PAUL APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION MUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 9, Application US/09377155
Patent No. 6197312
Sequence 2, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; ORGANISM: Neisseria meningitidis US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 99.5%;
Best Local Similarity 99.4%;
Matches 354; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Patentin Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOFTWARE:
```

ö

```
121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                        181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                           243 DNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKLVTGKGKG 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENGSSTDEGEGGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNKFVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNKPVRITHVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 96.4%; Score 1748.5; DB 3; Best Local Similarity 97.2%; Pred. No. 3.1e-136; Matches 347; Conservative 2; Mismatches 7;
                                                                                                                                                                                                                                                                           Sequence 15, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
PAPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MONON, E. Richard
TTTLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT APPLICATION NUMBER: PCT/AU98/01031
PRIOR PILING DATE: 1999-18-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 15
LENGTH: 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 15, Application US/09669974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   , ORGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                       RESULT 9
US-09-377-155-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 10
US-09-669-974-15
                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                         418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TYPE: PRT
                        Q
                                                                                                                                                Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ōλ
                                                            δy
                                                                                         a
                                                                                                                      ò
                                                                                                                                                                                ò
                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                        1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                       121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                       DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                  LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1; Gaps
                                                                                                                        1;
                                                                                          Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 4; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                      5; Indels
                                                                                          3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 1753.5; DB 4;
Pred. No. 1.2e-136;
4; Mismatches 5;
                                                                                      Score 1753.5; DB 3
Pred. No. 1.2e-136;
4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT FILING DATE: 1099-08-19
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR PILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 9, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; ORGANISM: Neisseria meningitidis
US-09-669-974-9
                             TYPE: PRT
ORGANISM: Neisseria meningitidis
                                                                                         96.7%;
97.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 96.7%;
Best Local Similarity 97.2%;
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 9
                                                                                         Query Match 96.73
Best Local Similarity 97.23
Matches 347; Conservative
                                               ; OKGANALIST-9
US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298
                                                                                                                                                                                                                                                                                                                                                          418
                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
   SEQ ID NO 9
                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                   δ
                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                       ð
```

```
LENGTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                              ò
                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                  Dp
                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                483 ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG-DALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ij
                                                                                                                                                                                                                                                                                                                                                                                                                 DB 4; Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  7; Indels
                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
96.4%; Score 1748.5; DB 4
Best Local Similarity 97.2%; Pred. No. 3.1e-136;
Matches 347; Conservative 2; Mismatches 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DENORN, SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 7
LENGTH: 594
TYPE: PRI
                          GENERAL INCOGNICANT:
CONTRACT TO THE RICHARD ANSELM
APPLICANT: DERNINGS, Michael Paul
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, ER RICHARD
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NOWBER: US/09/669,974
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
FRIOR FILING DATE: 1997-12-13
SOFTWARE: PALENTIN NOWBER: GB 9726398.2
FRIOR FILING DATE: 1997-12-12
SROID NO 15
SEQ ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 7, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Neisseria meningitidis
US-09-669-974-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
Patent No. 6333173
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
```

```
Ĥ
                                                                                                                                                                                                                                                                                                          121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                         181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                               240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                 297
                                                                                                                                                                                                                           61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                               358 TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 594;
                                                             DB 3; Length 594;
                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 4;
                                                                                                    8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96.1%; Score 1741.5; DB 4;
ilarity 96.9%; Pred. No. 1.2e-135;
Conservative 2; Mismatches 8;
                                                           Score 1741.5; DB 3
Pred. No. 1.2e-135;
2; Mismatches 8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GREERAL INFORMATION:
APPLICANT: PEAK, IEN Richard Anselm
APPLICANT: DEAK, IEN Richard
APPLICANT: DENNINGS, Michael Paul
APPLICANT: DENNINGS, Michael Paul
SPELICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 12
US-09-669-974-7
; Sequence 7, Application US/09669974
; Patent No. 6333173
; ORGANISM: Neisseria meningitidis US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM: Neisseria meningitidis
                                                           96.18;
96.98;
                                                           Ouery Match
Best Local Similarity 96.9
Matches 346; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Simi
Matches 346;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO 7
```

9

```
δŽ
                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                             δy
                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Dρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                        181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 60
                                                                                                             300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 3; Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 1728.5; DB 3;
Pred. No. 1.4e-134;
3; Mismatches 9;
                                                                                                                                                                                                                                        APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE OF INVENTATION: NOVEL SURFACE ANTIGEN CURRENT APPLICATION NUMBER: US/09/377,155 CURRENT FILING DATE: 1999-08-19 PRIOR APPLICATION NUMBER: GB 9726398.2 PRIOR FILING DATE: 1998-12-14 PRIOR PLING DATE: 1997-12-12 PRIOR FILING DATE: 1997-12-12 SUNBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Sequence 17, Application US/09669974
; Patent No. 6333173
; GENERAL INFORMATION:
; APPLICANT: PEAK, Ian Richard Anselm
                                                                                                                                                                                                                  Sequence 17, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity 96.4%;
Matches 344; Conservative 3
                                                                                                                                                                                     RESULT 13
US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 14
US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQ ID NO 17
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                           g
                                                                                                                ŏ
                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                       ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
```

```
61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1728.5; DB 4;
Pred. No. 1.4e-134;
3; Mismatches 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 5, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MONON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT APPLICATION NUMBER: PCT/A098/01031
PRIOR APPLICATION NUMBER: CB 9726398.2
PRIOR FILING DATE: 1999-18-12
PRIOR PLING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIN Ver: 2.0
SEQ ID NO 5
LENGTH: 598
           AFFLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR PILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
SOFTWARE: PATENTING DATE: 1997-12-12
SOFTWARE: PATENTING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN Ver. 2.0
SEQ ID NO 17
JENNINGS, Michael Paul
                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM: Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: PRT CORGANISM: Neisseria meningitidis US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                      95.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 344; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                             US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local 3
                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
```

```
181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                     240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                            LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                    Gaps
 Length 598;
                 Indels
Score 1728.5; DB 3;
Pred. No. 1.4e-134;
4; Mismatches 10;
tch 95.3%; al Similarity 95.8%; 342; Conservative
Query Match
Best Local S
Matches 342
                                                                                                                                                                                            300
                                                               61
                                                                              302
                                                                                                                                            422
                                              qq
                                                                                                                                                                          g
                                                               ò
                                                                              g
                                                                                              δy
                                                                                                           g
                                                                                                                             οy
                                                                                                                                         a
                                                                                                                                                          δ
                                                                                                                                                                                            ð
```

Search completed: October 6, 2003, 09:35:59 Job time : 10.5202 secs

THIS PAGE BLANK (USPTO)

Mon Oct

```
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
```

model	
using sw	
search, u	
protein s	
1	
protein	
ŏ	

6, 2003, 09:13:35 ; Search time 10.1906 Seconds (without alignments) 3359.577 Million cell updates/sec October Run on:

US-09-771-382-37 1813 1 NNVDFVRTYDTVEFLSADTK......TASGNSRGHFGASASVGXQW 356 Title: Perfect score: Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

283308 seqs, 96168682 residues Searched:

283308 Total number of hits satisfying chosen parameters: \cdot

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR_76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description		probable surface f	surface protein XF	surface protein XF		probable adhesin E	probable autotrans	probable surface p	cell surface prote	surface-exposed on	flagellin [importe	O	adhesin homolog HI	fibrinogen-binding	flagellin - Escher	fibrinogen-binding	probable exported	hypothetical prote	adhesin/invasin, p	high-molecular-wei	ABC-type transport	probable flagellin		high-molecular-wei	probable adhesin h	glycoprotein Vp260	cal	flagellin - Escher	sapB protein - Cam
SUMMARIES	ID	G81133	A81888	D82671	A82615	A86036	н91188	AC0976	AH0110	AB3486	C82672	F90961	F85809	I64138	S41539	C48658	D89852	AE0169	T31105	A81019	B43855	C48399	н90681	D85532	A43855	AF0394	T17508	•	A48658	140711
	DB	:						~															~	~	7	~	~	~	~	7
	Length	591	592	2059	1190	1588	1588	1107	658	365	1004	585	585	298	933	584	989	364	4919	364	1477	2020	980	980	1536	1910	1335	1461	595	936
ď	Query Match	99.7	7.96	18.3	18.0	17.9	17.9	17.3	17.0	10.1	9.7	9.5	9.5	9.0	8.6	8.6	9.0	8.5	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.2	8.1	8.1	8.0	8.0
	Score	1808	1752.5	332.5	327	325	325	314	307.5	183.5	176.5	167.5	167.5	163	156.5	156	155.5	154	153	152.5	152	151.5	151	151	151	148	147	146	145	144.5
	Result No.		7	3	4	S	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

RESULT 2

S-layer protein - hemolysin [importe	extracellular seri hypothetical prote	propagate bigs tive conserved hypothet hypothetical prote	hypothetical prote	surface array prot hypothetical prote	probable RTX famil hypothetical prote	adhesin/invasin-li adhesin/invasin-li	· autotransporter pr
T03415 AI0452	AB3528 C85739	AF2959 H98323	T25804 S41525	140614 A85547	B85547 F90696	D90697 G85547	AD3203
7 7	777	9 70 70	77	122	7 7	77	7
1361 1635	2554 906	1052	1519	920	5188 5291	338 338	1035
8.0	0.0.0	6.7	0.0	7.8	7.8	7.8	7.8
144.5	143.5	143.5	143	142	142	141.5	141.5
30	2 E F	# 12 · 60	37	0 8 0 0 0 0	41	44	45

ALIGNMENTS

	RESULT 1 G81133 G31635 C; Date: 31-Mar- C; Date: 31-Mar- C; Accession: G8 R; Tettelin, H; Hickey, E.K.; H Hickey, E.K.; H A; Authors: Gran A; Complexion: G8 A; Complexion: G9 A; G9 A; Complexion: G9 A; G9	RESULT 1 G81133 adhesin NWB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Decies: Neisseria meningitidis R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Science 287, 1809-1815, 2000 A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoll, R.; A;Reference number: A81000; MUID:20175755; PMID:10710307 A;Reference number: A81000; MUID:20175755; PMID:10710307 A;Residues: 1-591 CTET> A;Cession: GB1133 A;Residues: 1-592 CTET> A;Cross-references: GB.:AE002450; GB:AE002098; NID:97226229; PIDN:AAF41395.1; PID:9722 A;Genetics: A;Genetics: A;Genetics: A;Genetics:
	Query Ma Best Loc Matches	Query Match 99.7%; Score 1808; DB 2; Length 591; Best Local Similarity 99.7%; Pred. No. 4.7e-97; Matches 355; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
	Qy Db	1 NNVDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 60 :
-	Qy Db	61 ENGSSTDEGEGLVTAKEVIDAVNKAGWRWKITTANGOTGQADKFETVTSGTNVTFASGKG 120
-	Qy Db	121 TTATVSKDDGGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
	Qy Db	181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
	Qy Db	241 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
-	Qy Db	301 PGKSNMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356

```
Score 327;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18.0%;
                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Contents: annotation
                                                                                                                                                                                                                                                                                           98;
                                                                                                                                                                               A; Gene: XF1529
                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C;Genetics:
A;Gene: XF1981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
                                                                                                                                                                                                                                                                                                                                                                                                          Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Species: Xylella fastidiosa
C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C;Accession: D82671
R;anconymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Sequence, 18-1157, 2000
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; MUID:20365717; PMID:10910347
A;Note: for a complete list of authors see reference number A59328 below
A;Accession: D82671
A;Note: for a complete list of authors see reference number A59328 below
A;Accession: D82671
A;Residues: 1-2059 <SINA
A;Esidues: 1-2059 <SINA
A;E
                                                                                                                       S.R.; Morel
Rajandream,
           (strain Z249
                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737989
A;Experimental source: serogroup A, strain 22491
probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain 224 C; Species: Neisseria meningitidis
C; Species: OS-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C; Accession: A81888
R; Parkhill, J.; Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; More in Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandream in Holle: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491.
A; Reference number: A8175; MUID: 2022556; PMID: 10761919
A; Accession: A81888
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-592 < PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 1752.5; DB 2; Length
Pred. No. 7.5e-94;
3; Mismatches 5; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atch 96.7%; cal Similarity 97.5%; 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Gene: NMA1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 347,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                    Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
```

```
F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.M.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L. A; Contents: annotation

Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1845 LRQLDAVAQKSNLQTDDM~~~~~~~~~~~~RHEINNIEDVFKITKGD~~S 1880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         147 VNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIAT 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |: ::|||:|:| |: || ||:|| |: || ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: ||:|| |: || |: || |: || |: || |: || |: || |: || |: ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28 SKDNGKKTEVKIGAKTSVIKEKDGKLVTG-KDKGENGSSTDEGEGLVTAKEVIDAVNKAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           87 WRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1881 ASSVKGMGVN----AMAIGTNAAVSGTESVALGK---NTNVSADNAVAI-GNG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  207 SMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          267 VAQNLNNRIDNVDGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 2059;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                18.3%; Score 332.5; DB 2; 29.3%; Pred. No. 2.5e-11; tive 53; Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  323 YSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
```

Length 1190;

5; DB

Best Local Similarity 27.3%; Pred. No. 2.6e-11; Matches 108; Conservative 52; Mismatches 143; Indels 92; Gaps 14;	qa	::::
OY 2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE 61 1	QV Dp	238 KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI 286 :
QY 62 NG-SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120	λ _O qα	287 AQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF 346
QY 121 TTATVSKDDQGNITVMYDVNVGDALNVNQLONSGWNLDSKAVAGSSGKVISGNVSP 176	. da	347 GASASVGYQW 356
Qy 177 SKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD 231	RESULT 6 H91188	
QY 232 ALNVGSKKDNKPV	probable C;Specie C;Date: C;Access	crain
QY 266 GVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI 321	R;Hayasr gasawa <i>re</i> DNA Res. A;Title:	R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han, C gasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H. DNA Res. B, 11-22, 2001 A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 and g
OY 322 GYSSISDGGNWIIKGTASGNSRGHFGASASVGYOW 356 :	A; Refere A; Access A; Status A; Molecu A; Residu	A;Reference number: A99629; MUID:21156231; PMID:11258796 A;Accession: H91188 A;Status: preliminary A;Molecule type: DNA A;Residues: 1-1588 <hay></hay>
RESULT 5 A86036 probable adhesin Z5029 [imported] - Escherichia coli (strain O157:H7, substrain EDL933) C:Species: Escherichia coli	A;Cross- A;Experi C;Geneti A;Gene:	references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154 mental source: strain 0157:H7, substrain RIMD 0509952 cs: ECS4480
C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 C;Accession: A86036 R;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhew iller, T.; Grotherk, R. T. Davis, N. W. Tim, b. Dimalants F. Datamonsis, F. Sandana	Query Match Best Local Matches 11	Match 17.9%; Score 325; DB 2; Length 1588; ocal Similarity 26.7%; Pred. No. 4.9e-11; s. 115; Conservative 58; Mismatches 165; Indels 92; Gaps 15;
	δλ Dp	1 NNVDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD 50
. ממאטי	do Oy	51 GKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGNRMKTTTANGQ 97
A.C.O.S. TELETENCES: UB.AEDUO1/4; NID:91Z318349; FIDN:AAC38/49.1; GSFDB:GNU0145; UWGF:23U C;Genetics: A;Gene: 25029	oy D	98TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMY 137
Query Match 17.9%; Score 325; DB 2; Length 1588; Best Local Similarity 26.7%; Pred. No. 4.9e-11; Matches 115; Conservative 58; Mismatches 165; Indels 92; Gaps 15;	Qy Dp	138 DVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET 184 :
OY 1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD 50	QV QD	185 VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGS 237 ::::
QY 51 GKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQ 97	Qy Dp	238 KKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGI 286 : : :
QY 98TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMY 137	oy ob	287 AQAIATAGLVQAYLEGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHF 346
QY 138 DVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET 184 : :	da Dp	347 GASASVGYQW 356
Qy 185 VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGS 237		

REGULT 7 COST	02 17 0% - Score 307 5 - DR 2
la enterica subsp. enterica serovar Typhi s has also been called Salmonella typhi #sequence_revision 09-Nov-2001 #text_change 18-Nov-2002	>
<pre>C;Accession: AC0976 R;ParKhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; Churcher, th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.; Farrar, S.: Moule, S.: O'Garra, P.</pre>	QY 40 GAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG 99
Nature 413, 848-852, 2001 A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; A;Title: Complete genome sequence of a multiple frug resistant Salmonella enterica seroy A;Reference number: ARG502. MITD: 215,48447. PMID: 11577608	QY 100 QADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALMVNQLQNSGMNLDS 159
A Accession: AC0976 A Status: preliminary A Molecule type: DNA A: Residues: 1-1107 < PARS	OY 160 KAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDIATSMTPQFSSVS 216 :
A.Cross references: GB:AL513382; PIDN:CAD03303.1; PID:g16504923; GSPDB:GN00176 C;Genetics: A;Gene: sapB	QY 217 LGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKG 266
Query Match 17.3%; Score 314; DB 2; Length 1107; Best Local Similarity 26.8%; Pred. No. 1.4e-10; Matches 109; Conservative 55; Mismatches 165; Indels 78; Gaps 14;	QY 267 VAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRG 315 ::
Qy 16 SADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLYTGKDKGE 61 : : :	QY 316 EAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356 :::: : Db 618 QSALSLGVSSISDSGRWVSKLQASSNTQGDFGIGVGVGYGW 658
OY 62 -NGSSTDEG-EGLVTAKEVIDAVNKAGWRMKTTTANGQTGGADKFETVTSGTN 112	RESULT 9 AB3486
NSGWNLD 158 YFKTNTDGA 884	cell surface protein [imported] - Brucella melitensis (strain 16M) C;Species: Brucella melitensis C;Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002
SKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGK 200	R;DelVecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanov.; Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Let. Proc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
201 NIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN 260	A;TLLE: The genome Sequence of the facultative intracellular pathogen bruce A;Reference number: AD3252; PMID:11756688 A;Accession: AB3486 A:Estius: preliminary
945 AVNVAQLKASEAGSVRYETNADGSVNYSVLNLGDGSGG-TTRIGNVSAAVNDTDAVN 1000	A; Molecule type: DAAA A; Molecule type: DAAA A; Residues: 1-365 < KUR>
QY 261 VAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIG 309	A;Cross-references: GB:AE008917; PIDN:AAL53053.1; PID:g17983913; GSPDB:GN001 A;Experimental source: strain 16M C;Genetics:
QY 310 GGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRCHFGASASVGYQW 356 	A;Gene: BME11872 A;Map position: I Oner Match 10 19. Core 102 5. DB 2. Footh 265.
SULT 8	Indels
AH0110 probable surface protein (partial) YPO0902 [imported] - Yersinia pestis (strain C092) C;Species: Yersinia pestis	QY 128 DDQGNIT-VMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVN 186 ::
C:Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 02-Nov-2001 R:Accession: AH0110 R:Parkhill, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.;	Qy 187 INAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGA
~ (1)	Qy 225 7LSVDGDALNV
A.Status: preliminary A.Molecule type: DNA A.Residues: 1-658 <kur></kur>	Qy 236GSKKDN
A;Cross reterences: GB:AL590842; PIDN:CAC89747.1; PID:g15978974; GSFDB:GN00175 C;Genetics:	Qy 281 NARAGIAQAPGKSMMAIGGG 311

S

```
flagellin [imported] – Escherichia coli (strain 0157:H7, substrain RIMD 0509952)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ÓΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Residues: I-1004 <SIM>
A; Residues: I-1004 <SIM>
A; Residues: L-1004 <SIM>
A; Residues: L-1004 <SIM>
A; Cross-references: GB:AE003981; GB:AE003849; NID:g9106543; PIDN:AAF84325.1; GSPDB:GN001
A; Experimental source: strain 9a5c
R; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; A Briones, M.R.S.; Bueno, M.R.P.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. Briones, M.S.; Bueno, M.C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraqa, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Remper, B.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigi Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marrino, C.L.; Marques, M.V.; Martins, E.M.F.; Matukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Mayaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.P. A; Authors: da Silva, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A; Reference number: A59328
A; Reference number: A59328
A; Genetics:
A; Genetics:
A; Genetics:
A; Genetics:
A; Genetics:
A; Genetics:
                                                                                                                                                                                                                                                             C; Species: Xylella fastidiosa
C; Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C; Accession: C82672
C; Accession: C82672
R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Sequen Nature 406, 151-157, 2000
A; Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A; Reference number: A82515; MUID:20365717; ApulD:10910347
A; Note: for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                    surface-exposed outer membrane protein XF1516 [imported] - Xylella fastidiosa (strain 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKKDNKPVRITHVVAPGVKEGDVTNVAQLKGVAQNLNNRIDNV------DGNARAGIA 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QAIATAGLVQAYLPGKSMMAIG------GGTYRGEAGYAIGYSSISDGGNWIIKGTA- 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----DAVNKAGWRMKTTTANGQTGQADKFETV----TSGTNVTFASGKGTTATVS-KD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             195 GIGNNDAVNKSQLDGVTASVN---DVAASVKTIALTNQVTGSSVASASGKESTAIGSGAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AG----NNIEITRNG----KNIDIATSMTPQFSSVSLGAGADAPTLSV----DGDALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE-NGSSTDEGEGLV--TAKEVI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      141;
                                                                      312 TYRGEAGYAIG-----YSSISDGGNW 332
                                                                                                                 321 FWRGEGAVALGLGHTSEDQRMRSNLSAATSGGNW 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9.7%; Score 176.5; DE 25.8%; Pred. No. 0.01; iive 58; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --SGNSRGH---FGASASVG 353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEGGTSLGYNSFVGQSATNG 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best_Local Similarity
Matches 98; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Accession: C82672
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                      셤
                                                                   ò
```

```
D.J.; May
K.; Apoda
                                                                                                                                                                ပ
                                                                                                                                                                                                                                                                                                                           б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hypothetical protein flic [imported] - Escherichia coli (strain 0157:H7, substrain ED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: GB:AE005174; NID:912516024; PIDN:AAG56938.1; GSPDB:GN00145; UWGP:
A;Experimental source: strain O157:H7, substrain EDL933
                                                                                                                                                                K.; Han,
H.
                                                                                                                                                                                                                                                                                                                           and
                                                                                                                               R.Hayashi, K.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Higasawara, N.; Yasunaga, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H. Dank Res, 8, 11-22, 2001

DAR Res, 8, 11-22, 2001

A.Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 in the complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 in the complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 in the complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 in the complete serion in F90961

A.Accession: F90961

A.Accession: F90961

A.Residues: 1-585 < HAX>

A.Residues: 1-58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQAD-KFETVTSGTNVTFAS-GKGTTATVS 126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----GGVDYTYNAKSGDFTTTK--STAGTGVDAAAQAADSASKRDALAATLHADVGKSVN 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSYTTKDGTV--SFETDSAGNITIGGSQAYVDDAGNLTTNNAGSAAKADMKALLKAASEG 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --GKVIS 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Potamousis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C.Species: Escherichia coli
C.Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001
C:Species: Escherichia coli
C:Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001
C:Accession: F90961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SDGASLTFNGTEYTIAKA - - - TPATTTPVAPLIPGGITYQATVSKDVVLS - - - - - ET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGA------G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NARAGIAQAIATAGLVQ---AYLPGKSMMAI-----GGGTYRGEAGYAIGYSSISDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10 DTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Title: Genome sequence of enterohemorrhagic Escherichia coli 0157:H7. A;Reference number: A85480; MUID:21074935; PMID:11206551 A;Accession: F85809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            :69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Accession: F85809
K;Perna, N.T.; Plunkett III, G.; Burland, V.; Mau, B.; Glasner,
iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.;
Nature 409, 529-533, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     127 KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 9.2%; Score 167.5; DB 2; Best Local Similarity 23.0%; Pred. No. 0.018; Matches 85; Conservative 54; Mismatches 161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NWIIKGTAS 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Gene: ECs2662
C;Superfamily: flagellin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-585 <STO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Status: preliminary
```

```
C; Superfamily: flagellin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οχ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       defeath homolog HII732 - Haemophilus influenzae (strain Rd KW20)

C;Species: Haemophilus influenzae
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage, R;Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M.
Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Venter, A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Accession: I64138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A)Status: nucleic acid sequence not shown; translation not shown
A;Molecule type: DNA
A;Residues: 1-298 <TIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:91574588; PID:91574589; TIGR:HI1732
                                                                                                                           16;
                                                                                                                                                                                                                                                                                                                                                                                                                                             343
                                                                                                                                                                                                                                            EGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQAD-KFETVTSGTNVTFAS-GKGTTATVS 126
                                                                                                                                                                                                                                                                               178 KGTITNKAATVSDLTSAGAKLNTT----TGLYDLKTENTLLTTDAAFDKLGNGDKVTV- 231
                                                                                                                                                                                                                                                                                                                                                       232 ----GGVDYTYNAKSGDFTTTK--STAGTGVDAAAQAADSASKRDALAATLHADVGKSVN 285
                                                                                                                                                                                                                                                                                                                                                                                                        220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         221 ADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDG 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NARAGIAQAIATAGLVQ---AYLPGKSMMAI-----GGGTYRGEAGYAIGYSSISDGG 330
                                                                                                                                                                                                                                                                                                                            --GKVIS 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKD--K 59
                                                                                                                                                                                                                                                                                                                                                                                                172 GNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGA------G
                                                                                                                                                                                                                                                                                                                                                                                                                                       286 GSYTTKDGTV - - SFETDSAGNITIGGSOAVVDDAGNLTTNNAGSAAKADMKALXKAASEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 344 SDGASLTFNGTEYTIAKA---TPATTTPVAPLIPGGITYQATVSKDVVLS-----ET
                                                                                                                                                            10 DTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEG
                                                                                                                           Gaps
                                                                                                                           69;
                                                                                    Length 585;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9.0%; Score 163; DB 2; Length 298;
llarity 49.3%; Pred. No. 0.014;
Conservative 11; Mismatches 23; Indels
                                                                                ch 9.2%; Score 167.5; DB 2; Length 1
1 Similarity 23.0%; Pred. No. 0.018;
85; Conservative 54; Mismatches 161; Indels
                                                                                                                                                                                                                                                                                                                        127 KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein - Staphylococcus aureus clumping factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |::|: |
281 ANTGTATNATE 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NWIIKGTAS 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVTVAGYAS 459
C;Genetics:
A;Gene: fliC
C;Superfamily: flagellin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 35; Conserv
                                                                                Query Match
Best Local Similarity
Matches 85; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S41539
fibrinogen-binding
N;Alternate names:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              281
                                                                                                                                                                                                                                            70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 14
                                                                                                                                                              ò
                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 qq
                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

```
flagellin - Escherichia coli (strain U5-41)
C;Species: Escharichia coli
C;Species: Escharichia coli
C;Species: Escharichia coli
C;Species: O3-May-1994 #sequence_revision 03-May-1994 #text_change 26-Aug-1999
C;Accession: C48658
R;Schoenhals, G.; Whitfield, C.
J. Bacteriol. 175, 5395-5402, 1993
A;Title: Comparative analysis of flagellin sequences from Escherichia coli strains po A;Reference number: A48658; MUID:93374833; PMID:8366026
                                                                                                                                                                                                   ß
C;Species: Staphylococcus aureus
C;Species: Staphylococcus aureus
C;Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 15-Oct-1999
C;Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 15-Oct-1999
R;Accession: S41539; S36630
A;Title: Molecular characterization of the clumping factor (fibrinogen receptor) of A;Title: Molecular characterization of the clumping factor (fibrinogen receptor) of A;Accession: S41539; MUID:94224142; PMID:8170386
A;Accession: S41539
A;Accession: S41539
A;Cocsarior: DNA
A;Residues: 1-933 <MCD>
A;Residues: 1-933 <MCD>
A;Cross-references: EMBL:Z18852; NID:9397525; PIDN:CAA79304.1; PID:9397526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |:| | : : | ||: | : | : | || || S-VSAAPKIDDINVSDIKISSNINNGETSVAQNPAQQETIQSSSINATIEETPVIGEATI 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123 ATVSK-----DDQGNITVMYDVNVGDALNVNQLQNSGWNL-----D 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | :: | | | :: | | :: | 120 TTTNQANTPATTQSSNTNAEELVNQTSNETTENDTNTVSSVNSPQNSTNAENVSTTQDTS 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           199 GKNIDIATSMTP-QFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVA--PGVKE 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300 GD------QVLANGVIDSDGNVIYTFTDYVNTKDDVKATLTMPAYIDPENVKKTG 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240 TVGIDSGTTVYPHQAGYVKLNYGFSVPNSAVKGDTFKITVPKELNLNGVTSTAKVPPIMA 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | :: :| |: :| |: :| |: :| DEIDRVSGQTQFNGVNVLAKDGSMK--IQVGANDGETITIDLKKIDSDTLGLNGFNVN-G 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFAS-GKGTTATVSK 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           71 GLVTAKEVIDAVNKAGWRMKTTTANGQT----GQADKFETVTSGTNVTF----ASGKGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24 VNVESKDNGKKTEVKIGAKTSVI------KEKDG--KLVTGKDKGENGSSTDEGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        256 GDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL------PG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10 DTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-564 <SGH>
A;Cross_references: GB:L07388; NID:g290438; PIDN:AAA23798.1; PID:g290439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 933;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8.6%; Score 156; DB 2; Length 584;
23.8%; Pred. No. 0.081;
tive 52; Mismatches 158; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 8.6%; Score 156.5; DB 2; Length 9 Best Local Similarity 21.0%; Pred. No. 0.13; Matches 83; Conservative 55; Mismatches 164; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      303 KSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGT 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    349 NVTLATGIGSTTANKTVLVDYEKYGKFYNLSIKGT 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         159 SKAVAGSSGKVISGNVSPSKGKMDETVNIN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 _
_
_
::
::
::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88; Conservative
```

. Y

THIS PAGE BLANK (USPTO)

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

October 6, 2003, 09:06:20 : Search time 5.49755 Seconds (without alignments) 3045.266 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-09-771-382-37 1813 1 NNVDFVRTYDTVEFLSADTK......TASGNSRGHFGASASVGYQW 356

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

127863 seqs, 47026705 residues Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt_41:* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

CITAMADITEC

O9pjt6 chlamydia m P50493 plasmodium P38536 t amylopull Q52657 rickettsia P22258 acetogenium P42273 proteus mir Q99170 yarrowia li P34487 caenorhabdi P45384 haemophilus Q07833 bacillus su P22552 camoylohact	•
Y741_CHLMU PVDB_PLAKN PVDB_PLAKN APU_THETU OMFA_RICCN SLAP_ACEKI FLC2_PROMI ERC2_PROMI FLC2_PROMI IGA2_HAEIN IGA2_HAEIN IGA2_HAEIN IGA2_HAEIN FLG2_HAEIN IGA2_HAEIN IGA2_HAEIN IGA2_HAEIN IGA2_HAEIN IGA2_HAEIN	
1007 1153 1861 2021 762 367 670 918 1694 1702 2334	
000000000000000000000000000000000000000	
122.5 122.5 122.5 122.5 122.5 121 121 121 121 121 121 121 121 121 12	
88888884444444444888888888844444444	

ALIGNMENTS

3888888888

This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).

~

```
1 (INCOMPLETE).
2 (INCOMPLETE).
                                                                                                                                                                                                                         MEDLINE=91100301; PubMed=1987123;
                                                                                                                                                                                 SEQUENCE OF 1-765 FROM N.A.
                                                                                                                                            Nature 413:852-856(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              387 SSVTDGATGMV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity 23,6
hes 86; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    514 51
1698 169
1795 179
1836 183
1953 AA;
                                                                                                                                                                                                      STRAIN=LT2;
                                                                                                                                                                                                                                                                                                           cofactor.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
      RRAPA
RRAPA
RRAPA
RRAPA
RRAPA
RETTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δŽ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                       23;
                                                                                                                                                                                                                                                                                                                                                                   --ESTITNGGTGTQINGDDATANNNGKTTVDGKDSTGTEINGNNGKVIQDGDLDVSGGGH 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----GTTATVSKDDQGNITVMYDVNVGDALNVNQ--LQNSGWNLDSKAVAGSSGKVISG 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          173 N--VSPSKGK-----MDETVNINAGNN-----IEITRNGKNIDI-ATSMTPQFSSVS 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDATANNNGKTIVDGKDSTGTEIAGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTM 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217 LGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR-I 275
                                                                                                                                                                                                                                                                                                                                        3 VDFVRTYDTVEFLSADTKT-----TTVNVESKDNGKKTEVKIGAKTSV---IK 47
                                                                                                                                                                                                                                                                                                                                                                                                                     48 EKDGKLVTGKDKGENG-----SSTDEGEGLVTAKE-----VIDA----VNKAGW 87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   363 GIDITGDSATV--DNKGTWTVTDPESIGIQVDGDQAVVNNEG---ESAIINGGTGTQING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTVDGKDSTG-TKIAGNIGIVN--LDG-SLTVTGG------AHGVENIGDNGTVNNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                          246 GNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDGDKAIVNNEG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RMKTTTANGQTGQADKFETVT-----SGTNVTFASGK-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TVTDPESIGIQIDGDQAIVNNEGES---TITNGGTG------TQINGNDATANNSGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
                                                                                                                                                                                                                                                              Length 2003;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BIGA_SALTY STANDARD; PRT; 1953 AA. P25927; P25928; Q9XCQ3; Cleated) PLMAY-1992 (Rel. 22, Created) 28-FEB-2003 (Rel. 41, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Putative surface-exposed virulence protein bigA precursor.
                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                       2003 AA; 205949 MW; B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Stoliljkovic I., Valentine P., Heffron F.; "Salmonella typhimurium rhs homolog."; Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                DB 1;
                                                                                                                                                                                                                                                                                ; Pred. No. 0.36;
54; Mismatches 154;
                                                                                                                                                                               I -> V (IN REF. 2).
I -> V (IN REF. 2).
                                                                                                                                                                                                                                                              8.4%; Score 151.5;
                                                                                                                                                           protein; Complete proteome
              EMBL; AE000237; AAC74483.1; ALT_SEQ. EMBL; AE000337; AAC74487.1; ALT_SEQ. EMBL; D90778; BAA15009.1; ALT_SEQ. EMBL; D90778; BAA18880.1; ALT_SEG. EMBL; M20778; BAA18881.1; ALT_SEQ. EMBL; X62680. ; NOT_ANNOTATED_CDS. ECGENE; EG11307; ydbA. Hypothetical protein; Complete proteom
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EQUENCE FROM N.A.
STRAIN=LT2 / SGSC1412 / ATCC 700720;
MEDLINE=21534948; PubMed=11677609;
                                                                                                                                                                                                                                                                            23.48;
                                                                                                                                                                                                                                                                              Local Similarity 23.4% les 101; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTASGNSRGHFG 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDIVVSDTGSIG 584
                                                                                                                                                                             489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Salmonella typhimurium.
                                                                                                                                                                                                    495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-ATCC 14028;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BIGA OR STM3478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                   Best Loca
Matches
ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
```

```
This SWISS-RROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to licenseéisb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   123 ATVSKD----DQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               333 YDSRGYLIIADDNTTVISGDDQAHNSDRGMDISG-----QDRTGVIISG-DRTVNTLTGD 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----ISGDGTTNTISGHSTVDNATG-ALISGNGTT 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               J. Bacteriol. 173:325-333(1991).
J. Bacteriol. Ref.3 sequence differs from that shown due to frameshifts in positions 414 and 732.
McClelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D., Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulyaney E., Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9 YDTVEFL-SADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGEN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTT
                                                                                                                                                  Waterston R., Wilson R.K.; "Complete genome sequence of Salmonella enterica serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Wu J.Y., Siegel L.M., Kredich N.M.; "High-level expression of Escherichia coli NADPH-sulfite reductase: requirement for a cloned cysG plasmid to overcome limiting siroheme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PUTATIVE SURFACE-EXPOSED VIRULENCE PROTEIN BIGA.
15 X 11 AA TANDEM REPEATS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7.8%; Score 141.5; DB 1; Length 1953; 23.6%; Pred. No. 1.3; Live 45; Mismatches 133; Indels 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            243 14.

252 15 (INCOMPLETE).

207 D -> DRGDDDVTPPDD (IN REF. 1).

514 A -> R (IN REF. 3).

1698 QYIE. 1).

1798 QYIE. -> ITU (IN REF. 1).

3A -> T (IN REF. 1).

5 200150 MW; 611B3FIC954D91AE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; AE133696; AAD39458.1; -.
EMBL; AE008859; AAL22340.1; -.
EMBL; M64606; AAA27042.1; ALT_FRAME.
EMBL; M64606; AAA27043.1; ALT_FRAME.
STYGene; SG10437; bigA.
Virulence; Repeat; Signal; Complete proteome.
```

```
non-profit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              008860;
01-NOV-1995
01-NOV-1995
28-FEB-2003
Flagellin.
                                    an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SHIFL
          modified e
                                                                                                                                                                                                                                                                                                                                                                                                                                                             430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    198
                                                                                                                                  InterPro;
                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                   or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FLIC_SHIFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ά
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                        610
|||:||:| || :
-----AGSTGTVIDGNNARVNN 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŝ
                                                                                                                                              SKKDNKPVRITNVAPGVK-EGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGL
                                                                                                                               296 VQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK-GTASGNSRGHFGASA----
                                   KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD---ALNVG
                                                         DGDMTIT-DGGTGGHITGDNVVIDNAGSTTV----SGADATALYIEGDNALVINEG
                                                                                                         NQ-----TISGGAVGTRIDGDDAHTTNTGDIA------VDGAGSAAVIINGDNGSL
                                                                                                                                                                                                                                                                          O9KKA3; O9KK98; O9XC45; 16-007-2001 (Rel. 40, Created) 16-007-2001 (Rel. 40, Last sequence update) 16-007-2001 (Rel. 40, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Outer membrane protein B precursor (168 kDa surface-layer protein) (Surface protein antigen) (Rela Surface antigen) (Surface protein) (Resa) (romp B) (Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptidel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Mechanisms of evolution in Rickettsia conorii and R. prowazekii."; Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Phylogenetic analysis of members of the genus Rickettsia using the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Barbe V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=Malish 7;
MEDLINE-21442074; PubMed=11557893;
MGDLINE-21442074; Renesto-Audiffren P., Fournier P.-E., Barbe Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M., Roult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          THIS BACTERIUM IS COVERED
                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene coding the outer-membrane protein rOmpB (ompB).";
Int. J. Syst. Evol. Microbiol. 50:1449-1455(2000).
TNFAGDIAVSGGTAIIIDGDNATIKNTGTSDISG
                                                                                                                                                                                                                                                                   1655 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-Indian tick typhus, and Malish 7;
MEDLINE-20393643; PubMed-10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBCELLULAR LOCATION: CELL WALL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 353-1655 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 33-1649 FROM N.A.
                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                       Rickettsia conorii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (BY SIMILARITY)
                                                                                                                                                        576 TQA-----
                                                                                                                                                                                                      611 DSVGF 615
                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                -SVGY 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Roux V., Raoult D.
                                                                                                                                                                                                                                                                OMPB_RICCN ST
Q9KKA3; Q9KK98; Q
16-OCT-2001 (Rel.
16-OCT-2001 (Rel.
                                                                                                                                                                                                                                                                                                                                                                antigen) (120 k
OMPB OR RC1085.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-Malish 7
                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIMILARITY)
                                                                                                                                                                                351
                                                                               237
                                                                                                        531
                                                                                                                                                                                                                                                      OMPB_RICCN
                                                                                                                                                                                                                                           RESULT
                                                                                                                                                                                                                                                                    ò
                                                         g
                                                                               ò
                                                                                                       쉽
                                                                                                                                ð
                                                                                                                                                       g
                                                                                                                                                                                à
                                                                                                                                                                                                      g
```

```
long as its content is in no way noved. Usage by and for commercial (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      100 QADKFETVT-----SGTNVTFASGKGTTATVSKDDQGNITVMYDV-----NVGD 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGKNIDIATSMTPQ----FSSV----SLGAGADAPTLSVDGDALNVGSKKDNKPVRITN 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NTYLITRTTNAAGQGKIIFNPVVNNNTTLATGTNLGSATNPLAEINFGSKGAANVDTVLN 719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDG-NARAGIAQAIATAGLVQ-----AYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     720 VGKGVNL-YATNITTTDA---NVGSFIFNAGGTNIVSG-----TVGGQQGNKFNTVALD 769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NTAGVITFDANGTLASASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSVFK 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        490 LADGTVINGKVNOTALVGGALAAGTITLDGSATITG----DIGNAGG----AAALQGITL 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  542 ANDATKTLTLGGANIIGANGGTINFQANGGTIKLTS--TQNNIVVDFDLAIATDQTGVVD 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            144 ALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-DETVNIN---AGNN--IEITR 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        600 ASSLTNAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGDVAINELVIGNNGAVQFAH 659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----KKTEVKIGAKTSVIK 47
                                                                                                                                                                                                                                                       EKDGKLVTGKDKG------ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 1; Length 1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301 PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRG 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Pred. No. 1.3;
48; Mismatches 176; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADFVASADGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 NVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
Last sequence update)
Last annotation update)
                         this statement is not removed.
    institutions as long
                                                                email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7.7%; Score 140;
                                              requires a license agreement
                                                                                                                                                                                                                                                  IPR005546; Autotransporter.
                                                                                                                                                                                                  PIR; E97835; E97835.
InterPro; IPR006315; Autotransport.
                                                                                                          EMBL; AE008659; AAL03623.1; -. EMBL; AF123721; AAF34124.1; -. EMBL; AF123726; AAF34129.1; -. EMBL; AF149110; AAD39533.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Rel. 32, C
(Rel. 32, I
(Rel. 41, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Local Similarity
Matches 98; Conserv
```

マ

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | :: :| |: || || :|| | | |: :: |
DEIDRYSGQTQFNGVNVLAKDGSMK--IQVGANDGQTITIDLKKIDSDTLGLNGFNVNGG 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EGL---VTAKEVIDAVNKAGWRMKTTTANGQTG--QADKFETVTSGTNV--TFASGKGTT 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239 ASATNYKYDSASKSYSFDTTTASAADVQKYLTPG-----VGDTAKGTITIDGSAQDV 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           347 SISF-TGNSTTPDTITYSVTGAK----VDQAAFDKAVSTSGNNVDFTTAGYSVNGTTGAVT 402
                                                                                                                                                                                                                                                                                                                                                                                                                                "Genome sequence of Shigella flexneri 2a: insights into pathogenicity through comparison with genomes of Escherichia coli K12 and O157."; Nucleic Acids Res. 30:442-4441(2002).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
-!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
                                                                                                                                                                                                                                                                                             STRAIN=301 / Serotype 2a;
MEDLINE=22272406; PubMed=12384590;
Jin O., Yuan Z., Xu J., Wang Y., Shen Y., Lu W., Wang J., Liu H.,
Yang J., Zhang X., Zhang J., Yang G., Wu H., Qu D., Dong J.,
Sun L., Xue Y., Zhao A., Gao Y., Zhu J., Kan B., Ding K., Chen S.,
Cheng H., Yao Z., He B., Chen R., Ma D., Qiang B., Wen Y., Hou Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATVS---KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK---VISGNVSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGKMDETVNINAGNNI - - - - - EITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     291 QISSDGKITASNGDKLYIDTTGRLTKNGS----GASLTEASLSTLAANNTKATTIDIGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNN------RIDNVDGNAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10 DIVEFLSADIKITIVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEG
                                                                                                                                                                              Fominaga A., Mahmoud M.A.-H., Mukaihara T., Enomoto M.;
*Molecular characterization of intact, but cryptic, flagellin genes
                Shigella flexneri.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1; Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 550 AA; 56636 MW; CC921C9A8EF200B6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               50; Mismatches 161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  284 AGI ----- AQAIATAGLVQAYLPGKSMMAIGGG 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred. No. 0.59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7.5%; Score 136.5;
                                                                                                                                                                                                                 in the genus Shigella.";
Mol. Microbiol. 12:277-285(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIR; S44980; S44980.
InterPro; IPR001029; Flagellin_C.
InterPro; IPR001492; FlagellinN.
Pfam; PF00700; Flagellin_C; I.
Pfam; PF00669; Flagellin_N; I.
                                                                                                                                                     MEDLINE=94335647; Pubmed=8057852;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AE015215; AAN43516.1; -.
                                                       Enterobacteriaceae; Shigella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; D16819; BAA04093.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRINTS; PR00207; FLAGELLIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 73; Conserv
                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                          [2]
SEQUENCE FROM N.A.
                                                                               NCBI_TaxID=623;
                                                                                                                                       STRAIN-IID642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Flagella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Loc
Matches
à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F., White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S., Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R., Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L., Eisen J., Fraser C.M.;
                                                                                                                                                                                                                                                                                                                                                                                                              Christiansen G., Boesen T., Hjerno K., Daugaard L., Mygind P., Madsen A.S., Knudsen K., Falk E., Birkelund S.; "Molecular biology of Chlamydia pneumoniae surface proteins and their role in immunopathogenicity,"; Am. Heart J. 138:S491-S495(1999).
                                                                                                                                092393; 09RB66;
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Probable outer membrane protein pmp8 precursor (Polymorphic membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kalman S., Mitchell W., Marathe R., Lammel C., Fan J., Hyman R.W., Olinger L., Grimwood J., Davis R.W., Stephens R.S., "Comparative genomes of Chlamydia pneumoniae and C. trachomatis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Shirai M., Hirakawa.H., Kimoto M., Tabuchi M., Kishi F., Ouchi K., Shiba T., Ishii K., Hattori M., Kuhara S., Nakazawa T.; "Comparison of whole genome sequences of Chlamydia pneumoniae J138 from Japan and CWL029 from USA.";
                                                                                                                                                                                                                                  protein 8) (Outer membrane protein 11).
PMP8 OR OMP11 OR CPN0446 OR CP0307.
Chlamydia pneumoniae (Chlamydophila pneumoniae).
Bacteria; Chlamydiae; Chlamydiales; Chlamydiaese; Chlamydiaese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -! - SIMILARITY: BELONGS TO THE PMP OUTER MEMBRANE PROTEIN FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUCLEIC ACIDS RES. 28:2311.2314(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'Genome sequences of Chlamydia trachomatis MoPn and Chlamydia
| : | : | : | 1 | . | 403 KGVDSVYVDNNEALTISDTVDFYLQDDGSVINGSG 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIRAIN=AK32;
MEDLINE=20150255; PubMed=10684935;
                                                                                                                                                                                                                                                                                                                                                                         STRAIN=VR1310;
MEDLINE=20007584; PubMed=10539856;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=CWL029;
MEDLINE=99206606; Pubmed=10192388;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=20330349; PubMed=10871362;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AJ133034; CAB37068.1; --
EMBL; AE001627; AAD18590.1; --
EMBL; AE002193; AAF38164.1; --
EMBL; AP002546; BAA98654.1; --
PIR; A81591; A81591.
PIR; D72078; D72078.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nat. Genet. 21:385-389(1999)
                                                                                                                  STANDARD;
                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=83558;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-AR39
                                                                                                                  CHLPN
```

S

```
18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      144 LSSAGALNLTDNG--TILFSQNVSNEANNGGAITTKTLSISG-NTSSITFTSNSAKKLG 200
                                                                                                                                                                                                                                                                                                                                                                                EGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKD- 128
                                                                                                                                                                                                                                                                                                                                                                                                   | | | : : | : : | AGKGGAIYCEKTGETPTLTISG------NKSLTFAENSSVTQGGAICAHGLDLSAA 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----DQGNITVMYDVNV-----GDALNVNQLQNSGWNLDSKAVAGSSGKVIS 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LGAG-----ADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDV-TNVAQLKGV 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AQNL--NNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSS 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----SGSLSLSANOGD 343
                                                                                                                                                                                                                                                                                                                                                91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TDSFDGAGGSTFTPKSTADANG -- TNYVLSGNVYINDAGKGTALTGCCFTETTGDLTFTG
                                                                                                                                                                                                                                                                                                                 TVEFLSADTKTTTVNVESKDNGKKTEVK1GAKTSV1KEKDGKLVTGKDKGE-NGSSTDEG
                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gilmore R.D. Jr., Joste N., McDonald G.A.;

"cloning, expression and sequence analysis of the gene encoding the
120 kD surface-exposed protein of Rickettsia rickettsii.";

Mol. Microbiol. 3:1579-1586(1989).

-!- FUNCTION: MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS
RICKETISIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.

-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
S-LAXER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                  POTENTIAL.
PROBABLE OUTER MEMBRANE PROTEIN PMP8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GNVSPSKGKMDETVNINAGNNIEITRNGK - - - - - NIDIATSMTPQFSSV - - -
                                                                                                                                                                                                                                                                                  97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                 Length 930;
                                                                                                            TIGREAMS; TIGRO1414; autotrans_barl; 1.
TIGREAMS; TIGRO1376; POMP_repeat; 6.
Outer membrane; Signal; Multigene family; Complete proteome.
                                                                                                                                                                                                                                                                                48; Mismatches 156; Indels
                                                                                                                                                                                                T -> A (IN REF. 3 AND 4).
46A9B5E3BB913C4C CRC64;
                                                                                                                                                                                                                                                 Score 136.5; DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-APR-1990 (Rel. 14, Created)
01-FEB-1996 (Rel. 33, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                 Pred. No. 1.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1300 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1: || : || : || : || 344 ITFLGNTLTSTSAPTSTRNAIYLGSSAKI 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISDGGNWIIKGTASGNSRG--HFGASASV 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPTLFSNNRC----GNTAAGKGGAIAIAD----
                                            InterPro; IPR005546; Autotransporter.
InterPro; IPR003368; Chlamydia_PMP.
Pfam; PF03197; Autotransporter; 1.
Pfam; PF02415; DUF145; 2.
                             InterPro; IPR006315; Autotransport.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120 kDa surface-exposed protein
                                                                                                                                                                                                               97669 MW;
                                                                                                                                                                                                                                                               22.68;
                                                                                                                                                                                                                                                                                88; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rickettsia rickettsii.
PHCI-2DPAGE; Q9Z393;
                                                                                                                                                                                                               930 AA;
                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120K_RICRI
P14914;
                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                                                                                                                              129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               326
                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                CONFLICT
                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                   Local
                                                                                                                                                               SIGNAL
                                                                                                                                                                                  CHAIN
                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                   Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                염
                                                                                                                                                                                                                                                                                                                 ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DKFETVT-SGTNVTFASG-----KGTTATVSKDDQGNITVMYDV-----NVGDALN 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LTNAQTLTINGKIGTIGANNKTLGQFNIGSSKTVLSNGNVAINELVIGNDGAVQFAHDTY 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EKDGKLVTGKDK - - - - - GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----KKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAGGAAALQRITLAN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLT-STQNNIVVDFDLAIATDQTGVVDASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
-!- MISCELLANEOUS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EPITOPES CONFERRING ANTIGENICITY TO THE PROTEIN.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels 117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1300;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VNQLQNSGWN-----LDSKAVA----GSSGKVIS-GNV-----
                                                                                                                                                                                                                                                              IR; Sv., IPROUD.... Anter.... InterPro; IPRO05546; Autor.... Pfam; PF03797; Autotransporter; 1. TIGRFAMS; TIGRO1414; autotrans_Darl; 2. TIGRFAMS; TIGRO1414; autotrans_Darl; 2. N-LINKED (POTENTIAL). N-LINKED (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (POTENTIAL). (POTENTIAL). (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E09E52C3F647243D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 1.6;
; Mismatches 162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 NVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 136.5;
                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-LINKED
N-L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7.5%;
                                                                                                                                                                                                                                           EMBL; X16353; CAA34402.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    132801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             926
1116
1128
1140
1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 95; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        920
926
1116
1128
1140
1146
1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
  Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       óχ
```

us-09-771-382-37.rsp

9

```
1334 1654
1181 1188
1654 AA; 168184
                                                                                             Query Match 7.5
Best Local Similarity 22.6
Matches 95; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               344 G 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             G 811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           repressor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13-AUG-1987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-K12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-K12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FLIC_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                      544
                                                                                                                                                                                                                                                                                         48
                                                                                                                                                                                                                                                                                                                                                                                      102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             811
                                               SEQUENCE
                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FLIC_ECOLI
  FT
                                                                                                                                                                                            δλ
                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                   ----SPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS 227
                                                                                        228 VDGDALNVGSKKDNKPVRIT----NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR 283
                                                                                                                           AGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSR 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A S-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rômpB)
(rômp B) [Contains: 120 kDa surface-exposed protein (Surface protein antigen) (120 kDa outer membrane protein ompB); 32 kDa beta peptide].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gilmore R.D. Jr., Josten N., McDonald G.A.;
"Cloning, expression and sequence analysis of the gene encoding the 120 kD surface-exposed protein of Rickettsia rickettsii.";
Mol. Microbiol. 3:1579-1586(1989)

FUNCTION: THE 120 kDB SURFACE-EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.

-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A LAYER WITH HEXAGONAL SYMMETRY.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                          309 LITRTTNAAGQGKIIFNPVVNNGTTLAA---GTNLGSATNPLAEINFGSKGVNVDT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsia rickettsii is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor."; Mol. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120 kDa SURFACE-EXPOSED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT; 1654 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pfam: PF03797; Autotransporter; 1.
TIGRRAMs; TIGRO1414; autotrans_bar1; 2.
Antigen; S-layer; Cell wall. 120 kDa SU
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Embi, 310227.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=R;
MEDLINE=92167802; PubMed=1724278;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 279-1654 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; X16353; CAA34403.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rickettsia rickettsii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                    344 G 344
                                                                                                                                                                                                                                                                                                                                    G 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                             OMPB_RICRI
                                                                                                                                          362
                                                                                                                                                                                                                                       412
                                                                                                                                                                                                                                                                                                                                    457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   053047;
                                                                                                                                                                                                                                                                                                                                                                                                                                    OMPB_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAGE STATE S
                                          엄
                                                                                          ò
                                                                                                                                     원
                                                                                                                                                                                     δy
                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                  g
```

```
430 NTAGVITFDANGTLESASADANVAVTNNITAIEASGAGVVQLSGTHAAELRLGNAGSIFK 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DKFETVI-SGINVIFASG-----KGTTATVSKDDQGNITVMYDV-----NVGDALN 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VDGDALNVGSKKDNKPVRIT----NVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNAR 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               284 AGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSR 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | | | : : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EKDGKLVTGKDK-----GENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DAKKTLTLGGANIIGAGGGTIDLQANGGTIKLT-STQNNIVVDFDLAIATDQTGVVDASS 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kuwajima G., Asaka J.-I., Fujiwara T., Fujiwara T., Node K., Kondo E., "Nucleotide sequence of the hag gene encoding flagellin of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        663 LITRITUAAGOGKIIFNPVVNNGTTLAA---GTNLGSATNPLAEINFGSKGVNVDT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----KKTEVKIGAKTSVIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       490 LADGTVINGKVNQTALVGGALAAGTITLDGSATITGDIGNAGGAAALQRITLAN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----SPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hanafusa T., Sakai A., Tominaga A., Enomoto M.; "Isolation and characterization of Escherichia coli hag operator mutants whose hag48 expression has become repressible by a Salmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----VLNVGEGVNLYATNITTTDANVGSFVFNAGGTNIVS-GTVGGQQGNKFNTV----
                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                           Indels 117;
                                                                                                                                                                                                                                                                          Length 1654;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VNQLQNSGWN-----LDSKAVA----GSSGKVIS-GNV-----
                                                                                                                          D7AB70FB7087F618
                                                                                                                                                                                                                                                                                                                                                                                                           162;
32 kDa BETA PEPTIDE. POLY-THR.
                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---VESKDNG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                13-AUG-1987 (Rel. 05, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
                                                                                                                                                                                                                                                                                                                                           ; Pred. No. 2.1; 47; Mismatches
                                                                                                                                                                                                                                                                          Score 136.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 NVDFVRTYD --- TVEFLSADTKTTTVN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mutants whose hag48 expression has
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteriol. 168:1479-1483(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=87057066; PubMed=3536885;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-89281489; PubMed-2659972;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mol. Gen. Genet. 216:44-50(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (Rel. 05, Created)
(Rel. 05, Last sequ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Flagellin.
FLIC OR FLAF OR HAG OR B1923.
                                                                                                                                                                                                                                                                                                                                                  22.6%;
```

~

```
INIT_MET
   SHE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                               ò
                                                                                                                                                                                             ά
                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                    DNA sequence adjacent to flagellar genes and evolution of flagellar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Link A.J., Robison K., Church G.M.; "Comparing the predicted and observed properties of proteins encoded in the genome of Escherichia coli K-12."; Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
F
             MEDLINE-97426617; PubMed-9278503; Battner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                proteome projects.";
J. Mol. Biol. 278:599-608(1998).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
-!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
                                                                                                                                                                       MEDLINE=97251358; PubMed=9097040;
Itoh T., Aiba H., Baba T., Fujita K., Hayashi K., Inada T.,
Isono K., Kasai H., Kimura S., Kitakawa M., Kitagawa M.,
Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,
Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T.,
Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T.,
Takeda J., Takemoto K., Wada C., Yamamoto Y., Horiuchi T.,
Takedo J., Takemoto K., Mada C., Yamamoto Y., Horiuchi T.,
Takedo J., Takemoto K., Mada C., Panamoto J., Horiuchi T.,
Takeda J., Takemoto K., Wada C., Panamoto J., Horiuchi T.,
Takeda J., Takemoto K., Wada C., Panamoto J., Horiuchi T.,
Takeda J., Takeda W., Panamoto J., Horiuchi T.,
Takeda J., Takemoto K., Wanamoto J., Horiuchi T.,
Takeda J., Takemoto W., Walamoto J., Inkaga Map.",
Dina Res. 3:379-392(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-K12 / W3110;
MEDLINE-98263247; PubMed-9600841;
Wilkins M.R., Gastelger E., Tonella L., Ou K., Tyler M.,
Sanchez J.-C., Gooley A.A., Wallsh B.J., Bairoch A., Appel R.D.,
Williams K.L., Hochstrasser D.F.;
"Protein identification with N and C-terminal sequence tags in
                                                                                          "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 1-19 FROM N.A.
MEDLINE-83238225; PubMed-6305924;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-12.
STRAIN-K12 / EMG2;
MEDLINE-97443975; PubMed-9298646;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SWISS-2DPAGE; P04949; COLI.
EcoGene; EG10321; filc.
InterPro; IPR001029; Flagellin_C.
InterPro; IPR001492; FlagellinN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; X17440; CAA35488.1; -... EMBL; AE00285; AAC74990.1; -... EMBL; D90832; BAA15744.1; -... EMBL; D90833; BAA15751.1; -... EMBL; J01607; AAA92491.1; -... PIR; A37249; FLEC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                          J. Bacteriol. 155:74-81(1983).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; M14358; AAA23950.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Flagella; Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRINTS; PR00207; FLAGELLIN
                                                                                                                                                                                                                                                                                                                                                                                     Szekely E., Simon M.;
                                                                                                                                                SEQUENCE FROM N.A.
                                                          Gregor J., Davis
                                                                                                                                                                                                                                                                                                                                                                                                                          phase variation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-4
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                  109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          144 -- ALNVNQLQNS-GWNLDSKAVAGSSGKVISGNVSPSKGKM------DETVNINAGNN 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : | | | :: | :: | | :: | 418 ASVDKFRSSLGAVQN--RLDSAVTNLNNTTTNL-SEAQSRIQDADYATEVSNMSKAQIIQ 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358 VKLGGDDGKTEVVDIDGKTYDSADLNGGNLQTGLTAGGEALTAVANGKTTDPLKALDDAI 417
                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                             EGLVTAKEV------DAVNKAGWRMKT--TTANGQTGQA-------DKFETVTS
                                                                                                                                                                                                                                                                                                                                                                                         178 DTVTTSAPVTAFGATTTNNIKLTGITLSTEAATDTGGTNPASIEGVYTDNGNDYYAKITG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   238 GDNDGKYYAVTVANDGTVTMATGATANATVTDANTTKATTITSGGTPVQIDNTAGSATAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            252 GVKE-----GDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQA-----IATAGLVQ
                                                                                                                                                                                                                          10 DTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                  10 GTN-----QGNITVMYDVNVGD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       193 IEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALN-VGSKKDNKPVRITNVAP
                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOI. Microbiol. 6:1539-1546(1992).
-!- FUNCTION: THIS IS AN ADHESION PROTEIN NECESSARY FOR THE DIFFUSE
ADHERENCE OF DIARRHEA-CAUSING ENTEROPATHOGENIC ESCHERICHIA COLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
NCBL_TaxID=562;
                                                                                                                                                                    79;
                                                                                                             Length 497;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=0126:H27 / 2787;

BEDLINE-92326638; PubMed=1625582;
BENZ I., Schmidt M.A.;
"AIDA-I, the adhesin involved in diffuse adherence of the diarrhoeagenic Escherichia coli strain 2787 (0126:H27), is synthesized via a precursor molecule.";

MOI. Microbiol. 6:1539-1546(1992).
                                                                                                                                                                    Indels
                            P -> L (IN REF. 2).
24B5419C21C7B4E8 CRC64;
                                                                                                          7.5%; Score 135.5; DB 1;
21.1%; Pred. No. 0.59;
live 66; Mismatches 147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-JUN-1994 (Rel. 29, Created).
01-JUN-1994 (Rel. 29, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1286 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A., AND SEQUENCE OF 50-56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -!- SUBCELLULAR LOCATION: Outer membrane.
0
284 P
51163 MW;
                                                                                                             Query Match 7.5%
Best Local Similarity 21.1%
Matches 78; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Adhesin aidA-I precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TO EPITHELIAL CELLS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | |::|
Q--AGNSVLA 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  298 AYLPGKSMMA 307
0
284 2
497 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Plasmid pIB6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AIDA_ECOLI
Q03155;
                            CONFLICT
                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AIDA_ECOLI
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AG-VRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTGSIDAANGINVNVKKDAIYQGTAL 1057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SAVTRPVERAVGKAAKLDATGVINDIGGIGAPNVGLDIGAQGGSSEKRSSSSQAVVSSVQ 946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       947 AGSIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSEAAANRQDEQSRDTR-----GS 998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               293 AGLVQAYLPGKSMMAIG----GGTYRGEAGYAIGYSSISDGGNW------IIKGTAS 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATSMTPQFSSVSLGA------GADAPTLSVDGDALNVGSKK--DNKPVRITNVA 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         251 PGV----KEGDV----TNVAQLKGVAQNLN------NRIDNVDGNARAGIAQAIAT 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                94 ANG---QTGQADKFETVTSGTNVTFASGKGTTATVSK-----DDQGNITVMYDVNVGDA 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDI 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI------GANVDY 886
                                                                                                                                                                                                                                                                                                                                                                                                                                          LSVESKTGNINVKAAERQQNIDEQKTALTVNGYAKEAGDKQYRAGLRIEHTRDSEKTTRT 727
                                                                                                                                                                                                                                                                                                                                                                                                          ---SKDNGKKTEV 37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             38 KIGAKTSVIKEKDGKLVTGKDKGENGSS--TDEGEGLVTAKEV--IDAVNKAGWRMKTTT 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Yersinia.
                                                                                                                                                                                                                                                                                                                                   7.3%; Score 132.5; DB 1; Length 1608; 22.7%; Pred. No. 3.3; ve 49; Mismatches 159; Indels 125;
                                                                                                                                                                                                                                                                                                  165078 MW; D669B476FE7DAD51 CRC64;
 REQUIRES SHLB FUNCTION.
SUBCELLULAR LOCATION: Outer membrane.
SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-JUL-1989 (Rel. 11, Created)
01-JUL-1989 (Rel. 11, Last sequence update)
01-JUL-1993 (Rel. 26, Last annotation update)
Invasin precursor (Outer membrane adhesin).
Yersinia pseudotuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          434 AA
                                                                                                                                                                                                                                               Hemolysis; Toxin; Outer membrane; Signal.
                                                                                                                                                                                                                                                                                  HEMOLYSIN
                                                                                                                                                                                                                                                                                                                                                                                                        15 LSADTKTTTVNVE-----
                                                                                                                                                                                                               EMBL; M22618; AAA50323.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1058 NGGRGKTAVNA 1068
                                                                                                                                                                                                                                                                                                                                                       Similarity 22.7 98; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     340 GNSRGHFGASA 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                    1608
                                                                                                                                                                                                                                                                                                      SEQUENCE 1608 AA;
                                                                                                                                                                                                                                 PIR; A28182; A28182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A. STRAIN=YPIII;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=633;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Plasmid pIB1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YADA_YERPS
P10858;
                                                                                                                                                                                                                                                                                                                                                                                                                                            899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           887
                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local 3
                                                                                                                                                                                                                                                                   SIGNAL
                                                                                                                                                                                                                                                                                       CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YADA_YERPS
                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  140 GGAQNIYNLGHASNTVIFSGGNQTIFSGGITDSTNISSGGQORVSSGG----VASNTTIN 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                                                                      SSTDEGEGLVTAKEVI ------DAVNKAGW-RMKTTTANGQT-----GQADKFE 105
                                                                                                                                                                                                                                                                                                                                                                                         ------0LQ 151
                                                                                                                                                                                                                                                                                                                                                                                                                          80 TVNSGGTQIVNNGGKTTATTVNSSGSQNVGTSGATISTIVNSGGIQRVSSGGVASATNLS 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                            .52 NSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQ 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  196 SSGAQNILSEEGAISTHISSGGNQYISAGA---NATETIVNSGGFQRVNSGAVATGTVLS 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297 -QAYLPGKSMMA-IGGGTYRGEAGYAIGYSSISDGGNWIIK--GTASG---NSRGHFGAS 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              313 QNIYSGGSALSANIKGSQIVNSECTAIN-TLVSDGGYQHIRNGGIASGTIVNQSGYVNIS 371
                                                                                                                                                                                                                                                                                                                                                     20 SELARGHGFVLAKNTLLVLAVVSTIGNAFAVNISGTVSSGGTVSSGETQIVYSGRGNSNA 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                212 FS---SVSLGAGADAPTLSVDGDA-LNVGSKKDNKPVRITNVA--PGVKEGDVTNVAQLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   266 GVAQNL-----NNRIDNV-----DGNARAGIAQAIATAGLV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            253 GGTQNVSSGGSAISTSVYNSGVQTVFAGATVTDTTVNSGGNQNISSGGIVSETTVNVSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=SNB;
MEDLINE-88257037; PubMed=3290200;
Poole K., Schiebel E., Braun V.;
"Molecular characterization of the hemolysin determinant of Serratia marcescens.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINED. FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. SHLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                J. Bacteriol. 170:3177-3188(1988).
-!- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Enterobacteriales
                                                                                                                                                                                                                                                                                    83;
                                                                                                                                                                                                                                                 Length 1286;
                                                                                                                                                                                                                                                                                                                                                                                         106 TVTS-GTNVTFASGKGTTATVSKDDQGNI----TVMYDVNVGDALNVN-
                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                               1286 AA; 132271 MW; B2A00F72AC05FB34 CRC64;
                                                                                                                                                                                                                                             7.4%; Score 134.5; DB 1;
24.4%; Pred. No. 2;
ive 48; Mismatches 145;
                                                                                                                      TIGRFAMS; TIGRO1414; autttrans_barl; 2.
Cell adhesion; Signal; Outer membrane; Plasmid.
SIGNAL 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria; Gammaproteobacteria;
Enterobacteriaceae; Serratia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Last sequence update)
Last annotation update)
                                                                                                                                                                              ADHESIN AIDA-I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT; 1608 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A., AND SEQUENCE OF 31-40
EMBL; X65022; CAA46156.1; -.
PIR; S28634.
Interpro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
InterPro; IPR004899; Pertactin.
                                                                                     Pfam; PF03797; Autotransporter; 1. Pfam; PF03212; Pertactin; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequ
01-NOV-1990 (Rel. 16, Last ann
                                                                                                                                                                                                                                                              llarity 24.4%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                1286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hemolysin precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Serratia marcescens.
                                                                                                                                                                                                                                                            Local Similarity
nes 89; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           350 ASVGY 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -SGGY 375
                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HLYA_SERMA
P15320;
                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                PROPEP
                                                                                                                                                                                                                                                                 Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

Gaps

σ

```
Isomerase;
                                                                                    Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NP_BIND
ACT_SITE
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TV---SKDDQCNITVMYDVNVG-DALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKG 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----NVAPGVKEG----DVT-NVAQLKGVAQ 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      270 N------LNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGY 319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LNARAKD----PYSIAIGATAEAAKPAAVAVGSGSIATGVNSVAIGPLSKALGDSAVTYGA 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTA 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSTAQKDGV-----AIGARASASDTGVAVGFNSKVDAQNSVAIGHSSHVAADHGYSI 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          339 SNQYIDHKFSQLDNRLDKLDKRVDKGLASSAALNSLFQPYGVGKVNFTAGVGGYRSSQAL 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180 KMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             279 SNSVARTTLETAEEHANKKSAEALVSAKVYADSNSSHTLKTANSYTDVTVSSSTKKAISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24 VNVESKDNGKKTEVKIG-----AKTSVIKEKDGKLVTG------KDKGEN-----G
                                                                                                                                                           FUNCTION: INVASIN IS À PROTEIN THAT ALLOWS ENTERIC BACTERIA TO PENETRARTE CULTURED MAMMALIAN CELLE. THE ENTRY OF INVASIN IN THE CELL IS MEDIATED BY BINDING SEVERAL BETA-1 CHAIN INTEGRINS. THIS PROTEIN IS AN ADHESIN FORMING A FIBRILLAR MATRIX ON THE CELL
                                                                                            MEDLINE-89343638; PubMed-2761389; Skurnik M., Wolf-Watz H.; Skurnik M., Wolf-Watz H.; "Analysis of the yopA gene encoding the Yopl virulence determinants Y Persinia Spp."; Mol. Witrobiol. 3:517-529(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                7.2%; Score.131; DB 1; Length 434;
21.1%; Pred. No. 0.91;
(ve 51; Mismatches 137; Indels 126;
          Rosqvist R., Skurnik M., Wolf-Watz H.;
"Increased virulence of Yersinia pseudotuberculosis by two
                                                                                                                                                                                                                                                                                                                                                                                                                            INVASIN.
EE2C55FB12B183D4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AIGYSSISDGGNWIIKGTA-SGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; Alsow, PERS 24, 204534.

PIR; S04534, S04534.

Pfam; PF03895; YadA; 1.

Plasmid; Virulence; Signal; Outer membrane.

25
                                                                                                                                                                                                                         SUBCELLULAR LOCATION: Outer membrane.
MEDLINE-88302441; PubMed-3043229;
                                                                                                                                                                                                                                                                                                                                                                                                                                       45054 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240 DNKPVRIT------
                                                                                                                                                                                                                                                                                                                                                   EMBL; X13883; CAA32088.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity 21.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                   independent mutations.";
Nature 334:522-525(1988)
                                                                                                                                                                                                                                                                                                                                                                                                                            26 4
434 AA;
                                                                       SEQUENCE FROM N.A.
                                                                                    STRAIN-YPIII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84;
                                                                                                                                                                                                               SURFACE
                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
```

PRT; 1398

STANDARD;

TOP2_PLAFK ID TOP2_PLAFK

```
between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                    II
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAK---TSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                              BREAKAGE AND SUBSEQUENT REJOINING OF DNA STRANDS. TOPOISOMERASE IN
MAKES DOUBLE-STRAND BREAKS.
CATALYTIC ACTIVITY: APP-dependent breakage, passage and rejoining
of double-stranded DNA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89; Indels 34; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -!- SUBGNIT: Homodimer (By similarity).
-!- SUBCELLULAR LOCATION: Nuclear.
-!- MISCELLANEOUS: EUKARYOTIC TOPOISOMERASE I AND II CAN RELAX BOTH
NEGATIVE AND POSITIVE SUPERCOILS, WHEREAS PROKARYOTIC ENZYMES
RELAX ONLY NEGATIVE SUPERCOILS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA-binding; ATP-binding; Nuclear protein
                                                                                                                                                                                                                                                                                                                                                            "The gene encoding topoisomerase II from Plasmodium falciparum."; Nucleic Acids Res. 22.2547-2551(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 131; DB 1; Length 1398;
Pred. No. 3.5;
                                                                                                                                                                                                                                                                     MEDLINE-94316496; PubMed-8041616;
Cheesman S., McAleese S., Goman M., Johnson D., Horrocks P.,
Ridley R.G., Kilbey B.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -!- SIMILARITY: Belongs to the type II topoisomerase family.
                                                                                                                                                               Alveolata; Apicomplexa; Haemosporida; Plasmodium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATP (FOTENTIAL).
DUA CLEAVAGE (BY SIMILARITY).
POLY-ASN.
POLY-ASN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       161029 MW; BAAD7BEE88FE5BE9 CRC64;
01-FEB-1995 (Rel. 31, Created)
01-FEB-1995 (Rel. 31, Last sequence update)
07-MAY-2000 (Rel. 39, Last annotation update)
DNA topoisomerase II (EC 5.99.1.3).
                                                                                                                                     Thailand)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     46; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SM00434; TOP4c; 1.
3; PS00177; TOPOISOMERASE_II; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLY-LYS.
POLY-LYS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Interpro; IPR003594; ATPBind_ATPBase.
Interpro; IPR003957; CBFA_MFYB_Lepis.
Interpro; IPR001241; DNA_topoisoII.
Interpro; IPR001205; DNA_topoisoIV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; X79345; -; NOT_ANNOTATED_CDS.
HSSP; P06786; 1BGW.
                                                                                                                                        (isolate K1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRINTS: PROD615; CCAATSUBUNTA.
PRINTS: PRO0418; TPIZFAMILY.
PRODOM: PD000742; DNA_topoisolV;
SMART; SMO0387; HATPASe_c; 1.
SMART; SMO0433; TOP2C; 1.
SMART; SMO0434; TOP4C; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pfam; PF00204; DNA_gyraseB; 1.
Pfam; PF00521; DNA_topoisoIV; 1.
Pfam; PF02518; HATPase_c; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 24.29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Topoisomerase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316
1093
1234
                                                                                                                                           Plasmodium falciparum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1398 AA;
                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                               NCBI_TaxID=5839;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
```

```
PIR; A35140; A35140
                                                                                                 g
                                                                                                                                                             g
                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                            δy
                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Yamagata S., Horiuchi T.;
Yamagata S., Horiuchi T.;
Yamagata S., Horiuchi T.;

**Construction of a contiguous 874-kb sequence of the Escherichia coli

**Construction of a contiguous 874-kb sequence of the Escherichia coli

**Tal genome corresponding to 50.0-68.8 min on the linkage map and
analysis of its sequence features.";

**DAR Res. 4:91-113(1997).

**INIMARITY: STRONG, TO BORDETELIA PERTACTIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      between the Swiss Institute of Bioinformatics and the EMBL outstation—
the European Bioinformatics Institute. There are no restrictions on its
use by non-profit institutions as long as its content is in no way
modified and this statement is not removed. Usage by and for commercial
entities requires a license agreement (See http://www.isb-sib.ch/announce/
or send an email to license@isb-sib.ch).
                  This SWISS-PROT entry is copyright. It is produced through a collaboration
121 TTATVSK--DDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGK---VISGNVS 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yamamoto Y., Aiba H., Baba T., Hayashi K., Inada T., Isono K.,
Itoh T., Kimura S., Kitagawa M., Makino K., Miki T., Mitsuhashi N.,
Mizobuchi K., Mori H., Nakade S., Nakamura Y., Nashimoto H.,
Oshima T., Oyama S., Saito N., Sampei G., Satoh Y., Sivasundaram S.,
Tagami H., Takeda J., Takemoto K., Uehara K., Wada C.,
                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
STRAIN=KIZ / MG1655;
MEDLINE=97426617; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                            "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                           176 PSKGKMDETVNINAGNNIEITRNGKNIDIATSMT---PQFSSV 215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 protein; Outer membrane; Complete proteome. 1569 AA; 162774 MW; 0D006A9A32154596 CRC64;
                                                                                                                                                          YPJA_ECOLI STANDARD; P77019; 1569 AA. P52143; P76610; P77017; P77019; 01-0CT-1996 (Rel. 34, created) (NOV-1997 (Rel. 35, Last sequence update) 16-0CT-2001 (Rel. 40, Last annotation update) Hypothetical outer membrane protein ypja.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRINTS; PR01484; PRTACTNFAMLY.
TIGRFAMS; TIGR01414; autotrans_barl; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL, D90889; BAA16514.1; ALT_INIT. EMBL, D90890; BAA16518.1; ALT_INIT. PIR; A65044; A65044. EcoGene, EG13213; ypja. InterPro; IPR006315; Autotransport. InterPro; IPR00546; Autotransporter. InterPro; IPR004899; Pertactin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; U36840; AAA79815.1; ALT_SEQ.
EMBL; AE000350; AAC75695.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; IPR003991; Pertactin_C.
Pfam; PF03797; Autotransporter; 1.
Pfam; PF03212; Pertactin; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=97349980; PubMed=9205837;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                  Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                             Shao Y.;
                                                                                                                                                                                                                                                                                                             NCBI_TaxID=562;
                                                                                                                                                                                                                                                   YPJA OR B2647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hypothetical
SEQUENCE 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN=K12;
                                                                                                                                                                                                                                                                                                                                                                                                                             Mau B.,
                                                        à
                                                                                    g
                                                                                                                                                                             셤
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the BMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is. in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                          10;
                                                                                                                                                                                                                                                                                                                                                                      | : | : | : | : | : | 578 EAKHVEQQSGGALIASTISGTLIEGTNSYGDAFYIRNSEAKNVVLENAGSLIVVTGSRAV 637
                                                                                                                                                                                                                                            523 NYVVLENTGELTVVAKTSAKNTTI-----DTGGKLIVQKEAKTDSTRLNNGGVLEVQDGG 577
                                                                                                                                                                                                                                                                                                                           ENGSSTDEGEGLV----TAKEVIDAVNKAG--WRMKTTTANGQTGQADKFETVTSGTNV- 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -TFASGKGTTATVSKD-----DQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSG 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    638 DTIINANGKMDVYGKDVGTVLNSAGTQTIYASATSDKANIKGGKQTVYGLATEANIESGE 697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLS 227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QIVDGGST-----EKTHINGGTQ-TVQNYGKAIN--TDIVSGLQQIMANGTAEGSIIN 747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 228 VDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIA 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            748 GGSQVVNEGGLAENSVLNDGGTLDVREKGSATGIQOSSQGALVATTRATRVTGTRADGVA 807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      288 QAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII--KGTASGNS 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :: | | : | | | : | 808 FSIEQGA-----ANNILLANGGVLTVESDTSSDKTQVNMGGREIVKTKATATGTT 857
                                                                                                                                                                     1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SUBCELLULAR LOCATION: Outer membrane.
MISCELLANDOUS: THE CONSERVED AMPHIPATHIC DOMAINS IN SHLA AND HPMA MAY BE RESPONSIBLE FOR PORE FORMATION.
SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB)."; J. Bacteriol. 172:1206-1216(1990).

-i- FUNCTION: BACTERIA HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-90170827; PubMed-2407716;
Uphoff T.S., Welch R.A.;
"Nucleotide sequencing of the Proteus mirabilis calcium-independent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Proteus.
NCBL_TaxID=584;
                                                                                          37;
                   Length 1569;
                                                                                          Indels
               ; Score 130.5; DB 1;
; Pred. No. 4.2;
60; Mismatches 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-AUG-1990 (Rel. 15, Created)
01-AUG-1990 (Rel. 15, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A., AND SEQUENCE OF 30-43. STRAIN*Isolate 477-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; M30186; AAA25657.1; -.
                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hemolysin precursor.
Query Match
Best Local Similarity
Matches 69; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Proteus mirabilis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HLYA_PROMI
P16466;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINED
                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              869
```

```
completed: October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                time
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Search
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
    SOURTHERETER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                 24;
                                                                                                                                                                                                                                                                                                               955 I-DSNNKL---HDQGTHYQSTQEGISLTANTHTSEATLDKHQTTFHETKGGGQIGVSTK- 1009
                                                                                                                                                                                                                                                                 ----TGSDITVAIKGEGQTTDNALMETKAKGSOFTSNGDISINVGE----NAHYEGAQF 1060
                                                                                                                                                                                                                                                                                                                                                                                                                                     1154 SEQDIALNATNKVDLQSASSEHTEKGNNLSGGVQAGFGKKMTDDASSVNGL-----GSA 1207
                                                                                                                                                                                                                                                                                                                                                   205 ATSMIPQFSSVSLGAGADAPTL--SVDGDALNVGSKKDNKPVRITNVAPGVKEGDVINVA 262
                                                                                                                                              46 IKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDA-VNKAGWRMKTTTANGQTGQADKF 104
                                                                                                                                                                                                                                       105 ETVTSGTNVTFA-SGKGTTA----TVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNL 157
                                                                                                                                                                                                                                                                                            DSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR-------NGK-NIDI 204
                                                                                                                                                                                                                                                                                                                                                                                                            QLKGVAQNLNNRID-----NVDGNARAGIAQ-----AIATAGLVQAYLPGKS 304
                                                                                                                          1 NNVDF---VRTYDTVEFLS--ADTKTTTVNVE-----SKDNGKKTEVKIGAKTSV 45
                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                repeated, near-identical sequences.";
Infect. Immun. 58:2760-2769(1990)
-!- FUNCTION: ELICITS PROTECTIVE IMMUNITY.
-!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A
S-LAYER WITH HEXAGONAL SYMMETRY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Anderson B.E., McDonald G.A., Jones D.C., Regnery R.L.; "A protective protein antigen of Rickettsia rickettsii has tandemly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence update)
11-CCT-2001 (Rel. 40, Last annotation update)
0uter membrane protein A precursor (190 kDa antigen) (Cell surface antigen) (rOmpA) (rOmpA).
                                                                                 Pred. No. 4.5; 56; Mismatches 130; Indels 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                     Length 1577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PTM: GLYCOSYLATED (PROBABLE).
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1208 OFAIGKODEKSVSREGGT-----INNSGNLTINGNS 1238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                305 MMAIG------GGTYRGEAGYAIGYSSISDGGNWIIKGTA 338
                             77 HEMOLYSIN.
165869 MW; 175975E0C924B2D9 CRC64;
                                                                  ; DB 1;
4.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2249 AA.
Hemolysis; Toxin; Outer membrane; Signal.
SIGNAL
                                                                    7.2%; Score 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90354033; PubMed=2117568;
                                                                                  22.8%;
                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STANDARD;
                           1577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rickettsia rickettsii
                           30 15
1577 AA;
                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=783;
                                                                                              92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OMPA_RICRI
P15921;
                                                                                                                                                                                                                                                                 1010
                                                                                                                                                                                                                                                                                            158
                                                                                                                                                                                                                                                                                                                        1001
                                                                                                                                                                                                                                                                                                                                                                               1100
                                                                                                                                                                                                                                                                                                                                                                                                           263
                                       SEQUENCE
                                                                    Query Match
                                                                               Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPA_RICRI
                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 15
FT
                                                                                                                                                     g
                                                                                                                                                                               ò
                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                   ò
```

```
961 VGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTGNANNGI-VTFTGNSTVT 1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1173 ATVNVGAGITLQA---GGSLAANNIDFGARSTLEFNGPLDGG-----GKAIPYYFKGAI 1223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1020 GNV----GNTNALATVNVGAGL--LOVOGGVVKANTINLTDNASAVTFTNPVVVTGAID 1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .073 NTGNANNGIVTFTGNSTVTGNVGN-----TNALATVNVGAG----LLQVQGGVVKANT 1121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1122 INLTDNASAVTFTN--PVVVTGAIDNTG-----NANNGIVTFTGNSTVTGDIGNTNAL 1172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123 ATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMD 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183 ETVNINAG-----NNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDAL--NV 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         902 TTKLTNAASVLTLTNANAVLTGAIDNTTGGDNVGVL-NLNGALSOVTGDIGNTNSLATIS 960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236 GSKKDN-KPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARA----GIAQAI 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11 TVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL--VTGKDKGENGSST-D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                - 68 EGEGLVT----AKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       291 AT----AGL-VQAYLPGKSMMA----SSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98;
                                                                                                                                                     OUTER MEMBRANE PROTEIN A.
13 X APPROXIMATE TANDEM REPEATS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1; Length 2249;
                                                                                                                 Antigen; Repeat; Signal; Cell Wall; S-layer; Glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7.2%; Score 130; DB 1; Length 22.
25.8%; Pred. No. 6.8;
Live 38; Mismatches 163; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E I (INCOMPLETE).
A9D6646C089DF087 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SDGGNWIIK-----GTASGNSRGH---FGASASVG 353
                                                                                                                                                                                                                                                        (TYPE I).
(TYPE II).
                                                                                                                                                                                                                                                                                                                                                                                                                        (TYPE II)
                                                                                                                                                                                                                                                                                                                                                                                                 (TYPE II)
                                                                                                                                                                                                                                                                                                                                                                                                                                        M (TYPE II
                                                                                                                                        POTENTIAL.
                                                                          Pfam; PF03797; Autotransporter; 1.
TIGRFAMS; TIGR01414; autotrans_barl; 3.
                                                                                                                                                                         13 X APPR
A (TYPE 1
B (TYPE 1
C (TYPE 1
D (TYPE 1
E (TYPE 1
G (TYPE 1
                                 InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                               (TYPE
(TYPE
(TYPE
                                                                                                                                                                                                                                                                                                                                                       (TYPE ]
                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               224333 MW;
EMBL; M31227; AAA26380.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ouery Match
Best Local Similarity 25.8%
Matches 104; Conservative
                                                                                                                                                                                                                                                                                                                                                                                               1021
1093
1165
1180
                                                                                                                                                                                                                                                                                                                                                                                                                                      1094 11
1166 11
2249 AA;
                  PIR; A41477; A41477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                 REPEAT
REPEAT
                                                                                                                                                                             DOMAIN
                                                                                                                                                                                                                                                        REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                      REPEAT
REPEAT
                                                                                                                                                                                                  REPEAT
                                                                                                                                                                                                                                                                                                                  REPEAT
                                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                      SIGNAL
                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                         REPEAT
                                                                                                                                                                                                                                                                                                                                                           REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
```

6, 2003, 09:24:18

: 6.49755 secs

THIS PAGE BLANK (USPTO)

```
Ogjpr8 neisseria m Ojjpr5 neisseria m Ojjpr5 neisseria m Ojjpr9 neisseria m Ojjpr9 neisseria m Ojjpr9 neisseria m Ojjpr0 haemophilus Ogjm7 haemophilus Ojjr0 kylella fas Ojpr0 kylella chia Ojpr0 kylella kalmonella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q8kqm8 moraxella c
Q8ckml yersinia pe
Q8zhj0 yersinia pe
Q9f3x5 pasteurella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTATVSKDDQCNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF157606; AAK68867.1; -.
InterPro; IPRO3599; YadA.
EMBL, AF157606; AAK68857.1; -.
Pfam; PF03895; YadA.
SEQUENCE 591 AA; 62048 MW; CODC600798859C65 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99.7%; Score 1808; DB 2;
99.7%; Pred. No. 2.3e-81;
tive 1; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                            Q9PD50
Q9PC04
Q8XDG4
Q8FCB2
Q8ZL64
Q9F2D8
                                                                                                                                                                                                                                                                                                                                        P71401
Q9F3X6
                                                                 Q9JPR9
Q93QY2
Q9JPS0
Q93QY5
Q9JPT0
                                                                                                                                                                            Q9JPIO
Q93QY1
Q48152
Q8GM79
Q8GM74
                                                                                                                                                                                                                                                                                                                                                                                                          Q8GM78
                       Q9JPS5
Q9JPH7
                                                                                                                                                                                                                                                                                                                   08GM76
                                                                                                                                                                                                                                                                                                                                                                                     Q8GM77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NhhA outer membrane protein.
NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best_Local Similarity 99.79
Matches 355; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
    Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-EG329;
  1744.5
1744.5
1744.5
1744.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
1728.5
17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 1
    0930Y3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCOCCOS SET THE SET OF THE SET O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      09jps1 neisseria m
09jps6 neisseria m
09jps7 neisseria m
09jps8 neisseria m
09jps3 neisseria m
09jqy4 neisseria m
09jqy4 neisseria m
09jps2 neisseria m
09jpps1 neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q93qy3 neisseria m
Q9jps7 neisseria m
Q9jr18 neisseria m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9aqfO neisseria m
Q9jps4 neisseria m
                                                                                                                                                                            alignments)
Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                             US-09-771-382-37
1813
1 NNVDFVRTYDTVEFLSADTK.....TASGNSRGHFGASASVGYQW 356
                                                                                                                                                         ; Search time 26.1469 Seconds
                       5.1.6
Compugen Ltd.
                                                                                                                                                                              (without 3513.485
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                          830525 segs, 258052604 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                         GenCore version
Copyright (c) 1993 - 2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                               - protein search, using sw model
                                                                                                                                                         2003, 09:13:10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9JR18
Q9AQF0
Q9JPS4
Q9JPS1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   09JPS3
093QY4
09JQW4
09JPI3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9JPS6
Q9JPS9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JPR7
Q9JPS8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JPS2
Q9JPH0
                                                                                                                                                                                                                                                                                                                                      BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sp_fung1:*
sp_human:*
sp_invertebrate:*
sp_mammal:*
sp_mhc:*
sp_organelle:*
sp_phage:*
sp_phage:*
sp_plant:*
sp_rodent:*
sp_rodent:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sp_unclassified:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sp_vertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                seq length: 0 seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sp_archea:*
sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Match Length DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SPTREMBL_23:*
                                                                                                                                                         9
                                                                                                                                                         October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1808
1808
1808
1804
1804
1787
1762.5
1758.5
1758.5
1758.5
1758.5
1750.5
1750.5
                                                                                                                                                                                                                                                                     Perfect score:
                                                                                                                                                                                                                                                                                                                                           Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB
Maximum DB
                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                          Searched:
                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
```

ó

~

엄

ò

g δ g

ŏ

```
1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-MC58 / Serogroup B;

STRAIN-MC58 / Serogroup B;

MEDLINB-201755; DubMed=10710307;

Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson K.E., Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J., Nelson W.C., Gwinn M.L., DeBOy R., Peterson J.D., Hickey E.K., Haft D.H., Salzberg S.L., White O., Fleischmann E.D., Dougherty B.A., Mason T., Ciecko A., Parksy D.S., Blair E., Cittone H., Clark B.B., Cotton M.D., Utterback T.R., Khouri H., Oin H., Vamathevan J., Gill, H.O., Fraser C.M., Moxon B.R., Rappuoli R., Venter J.C.; Smith H.O., Fraser C.M., Moxon B.R., Rappuoli R., Venter J.C.; "Complete genome sequence of Neisseria meningitidis serogroup B strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF226375; AAF4254.1;
EMBL; AF226375; AAF42516.1;
EMBL; AF226377; AAF42516.1;
EMBL; AF226377; AAF42516.1;
EMBL; AF226377; AAF42516.1;
EMBL; AF226377; AAF42516.1;
TIGR; NMB0992;
   536 PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                   PETRAIN-MCSB / Serogroup B, BZ169, BZ83, and H44/76;
MEDLINE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
I'dentification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ó:
                                                                                                                                                         01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992 (Adhesin) (NhhA outer membrane
                                                                                                                                                                                                                                                                         Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7C22F3CAE7F73EC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 1808; DB 10,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                   591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. SPECIES=N.meningitidis; STRAIN=PMC21;
                                                                                                                                       Created)
                                                                                                                                                                                                                                                     Neisseria meningitidis, and
Neisseria meningitidis (serogroup
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62112 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Science 287:1809-1815(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99.78;
99.78;
                                                                                                                                       (TrEMBLrel. 15,
                                                                                                                                                                                                                                   GNA992 OR NMB0992 OR NHHA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                               Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PF03895; YadA;
                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=487, 491;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              proteome.
591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
nes 355; Conserv
                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                     01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Complete | SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                   protein)
                                                                                                                     Q9JR18;
                                                                                                   09JR18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MC58
                                                             RESULT 3
                                                                               09JR18
   a
                                                                                                   рp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Óλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                     356 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 60
                                       MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGOTGOADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                             PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                 PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Comanducci M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Indentification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing."; Serogroup B Science 287:1816-1820(2000).

EMBL, AP226366, AAF4251.; ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 1808; DB 2; Length 591;
Pred. No. 2.3e-81;
1; Mismatches 0; Indels (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        62113 MW; 533453CAE5A91E1F CRC64;
                                                                                                                                                                                                                                                                                                                                                                 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                 591 AA
                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                           Outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 99.7'
Matches 355; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pfam; PF03895; YadA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-BZ147
                                                                                                                 241
                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  356
                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEOUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                               GNA992.
                                                                                                                                                                                                                                                                                                                               09JPS7
```

ò 셤 g

õ a ŏ

ö

g

ŏ qq ŏ

ö

3

```
537 PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity
Matches 351; Conserv
                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                      Neisseriaceae; N
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                            GNA992
                                                Q9JPS4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q9JPS1
                             Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9JPS1
                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ă
                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                                                180
                                                                   415
                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              536
                                                                                                                             NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FTRAIN-WC58;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.;
Identification and characterisation of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (FEB-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF125375; AAK09243.1;
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                        DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
        ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                               TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLYTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                     PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 592;
                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                        62290 MW; 168986A97381EFC5 CRC64;
                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 99.5%; Score 1804; DB 2; Best Local Similarity 99.4%; Pred. No. 3.7e-81; Matches 354; Conservative 1; Mismatches 1
                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                       (TrEMBLrel. (TrEMBLrel.
                                                                                                                                                                                                                                                             01-JUN-2001 (TrEMBLrel.
                                                                                                                                                                                                                                                                                           Outer membrane protein.
                                                                                                                                                                                                                                                                                                               Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                 01-OCT-2002
                                                                                                                                                                                                                                                                       01-JUN-2001
                                                                                                                                                476
                           962
                                             121
                                                                                                                             241
                                                                                                                                                                   301
                                                                                                                                                                                       536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
       61
                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                         Q9AQF0
                                                                                                                                                                                                                     RESULT
                                                                                                                                                                                                                               Q9AQF0
                                                                                                                            ò
                                                                                                                                                셤
                                                                                                                                                                   ò
                                                                                                                                                                                   g
                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                          g
                                               ò
                                                                 g
                                                                                      ŏ
                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             đ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏ
```

```
300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MDETVNINAGNNIEITRNGKNIDIATSMTPQPSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                       Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98.6%; Score 1787; DB 2; Length 526; llarity 98.6%; Pred. No. 2.2e-80; Conservative 2; Mismatches 3; Indels
                                                                                                                                                                                                          Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        54732 MW; F543C4234AF807CA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
GNA992.
                                                                            Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226377; AAF4556.1; -.
InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA.
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              530
                                                    Created)
PRT;
                                                                                                                                                                                                                                                                                                                                     STRAIN=NG6/88;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                             Outer membrane protein GNA992.
                                           01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2002 (TrEMBLrel. 22,
                                                                                                                                                                                                                                   Neisseria
                                                                                                                                                                                  Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pfam; PF03895; YadA;
SEOUENCE 526 AA;
```

ö

240

ö

Gaps

ö

us-09-771-382-37.rspt

```
245 DNVDFVHTYDTVEFLSADIKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKGG 304
                                                                                                                                                                                                                                                                                                                                                                                       ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                            TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 424
                                                                                                                                                                                                                                                                                                     1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffrisa A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 592;
                                                                                                                                                                                                                           Length 600;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                       Score 1770; DB 2; Length 6
Pred. No. 1.8e-79;
1; Mismatches 6; Indels
                                                                                                                                                                                   36256963E0598CD1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4A3471514FD3C879 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 2;
                                                                              Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226371; AAF42520.1; -.
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA: 1.
SEQUENCE 600 AA; 62762 MW; 36256963E0596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 1762.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61917 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              membrane protein GNA992
                                                                                                                                                                                                                       97.6%;
98.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; AF226361; AAF42510.1;
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 592 AA; 61917 MW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (TrEMBLrel. 15, (TrEMBLrel. 15, (TrEMBLrel. 22,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97.28;
                                                                                                                                                                                                                                            Local Similarity 98.0
nes 349; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-OCT-2002 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM STRAIN-860800;
                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                             305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            545
                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Outer
                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
Q9JPS9
    RA
RA
RT
RT
DR
DR
SO
SO
                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δy
                                                                                                                                                                                                                                                                                                                                                                                       QΫ
                                                                                                                                                                                                                                                                                                                                                                                                                         OD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NKPVRITHNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 474
                                                                                                                                                       Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A. Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
A. Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A. Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A. Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappoli R.;
T. Identification of Vaccine Candidates Against Serogroup B.
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R. EMBL, AF2529.1;
R. InterPor, IPR005594; YadA.
R. Pfan; PF03895; YadA.
R. Pfan; PF03895; YadA.
SEQUENCE 530 AA; 55190 MW; IF836CA57598515B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 NNVDFVRTYDTVEFLSADTKTTTVNVESKONGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ·
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 530;
                  Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98.6%; Score 1787; DB 2; 98.6%; Pred. No. 2.2e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ź
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last seq
01-OCT-2002 (TrEMBLrel. 22, Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                    STRAIN=NGF26;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Outer membrane protein GNA992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseriaceae; Neisseria
Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                           NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          09JPS6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNA992.
```

Matches

ò 셤 õ g ò g ð a ò

9Sdr60

RESULT 7

q

δ

qq

S

```
482
                                                                                                                 300
                                                                                                                                                   542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG-DALNVGSKKD 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG-DALNVGSKKD
                                                                                                                     NKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                    PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                     PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffrise A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     j;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1758.5; DB 2; Length 599;
Pred. No. 6.4e-79;
1; Mismatches 5; Indels 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteóbacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBL_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62693 MW; 46C2E974AF7F78E9 CRC64;
                                                                                                                                                                                                                                                                                                                                     01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter_membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AF226364; AAF42513.1; -: InterPro; IPR005594; YadA. Pfam; PF03895; YadA; 1. SEQUENCE 599 AA; 62693 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    97.0%;
98.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity 98.0
Matches 349; Conservative
                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A. STRAIN=A22;
                                                                                                                   241
                                                                                                                                                    483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                    123
                                                                                                                                                                                      301
                                                                                                                                                                                                                     543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                          GNA992.
                                                                                                                                                                                                                                                                                                        93JPS8
                                                                                                                                                                                                                                                                      RESULT 10
                                                                                                                                                                                                                                                                                                                         δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                   a
                                                  δy
                                                                                  q
                                                                                                                 ٥y
                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                   ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                      TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                     DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122 TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 181
                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                        300 LPGKSMMAIGGGTYRGEACYAIGYSSISDGGNWIIKGTASGNSRCHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                          MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDG-DALNVGSKK
                                                                                                                                                                                                                                                                                                                                         476 ANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hudt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffites A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ï
                     ;
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Outer membrane protein GNA992.
GNA992.
Heisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2; Length
                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0881CC094F33B4D4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1/30.0,
Pred. No. 6.4e-79;
                 5.
   No. 4e-79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              598 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Meningococcus by Whole-Genome Sequencing.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97.0%; Score 1758.5; 98.0%; Pred. No. 6.4e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1; Mismatches
                 Mismatches
   Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=SWZ1U/;
MEDLINE=20175756; PubMed=10710308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95; Yada; 1.
598 AA; 62431 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Science 287:1816-1820(2000).
EMBL; AF226385; AAF42534.1;
InterPro; IPR005594; Yada.
 98.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           349; Conservative
                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-SWZ107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pfam; PF03895
                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                         536
                                                                                                                 61
                                                                                                                                                   967
                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
Best Local
Matches 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JPR7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 9
```

Q9JPR7

δ qq ò ద

Dp

οy

a

à

à g g

ò

δλ

9

```
meningitidis Z2491.";
Nature 404:502-506(2000).
                                                                                                                                                                                           Similarity
                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                           NCBI_TaxID=487;
                                                                           STRAIN=EG327
             Neisseria
                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                      298
                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                  Query Match
                                                                                                                                                                                           Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   мосбо
   α
                                                                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                                                                               Dρ
                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δλ
                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                D
                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                             293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNKPVRITHVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                      Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zora Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettellin H., Hood D.W., Jeffries A.C., Sanders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                                                                                                                                                                                      1;
                                                                                                                                                Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                 2; Length
                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                               Pfam; PF03895; Yada; 1.
SEQUENCE 590 AA; 61661 MW; 8AA476AC300D80C8 CRC64;
                                                                                 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                Score 1756.5; DB 2;
Pred. No. 7.9e-79;
3; Mismatches 5;
                                                                                                                                                                                                                                                                                                        Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
EMBL; AF226378; AAF42527.1; -.
InterPro; IPR005594; YadA.
                                                                PRT;
                                                                                                                                                                                                             MEDLINE-20175756; PubMed-10710308;
                                                                                                                                                                                                                                                                                                                                                                                96.98;
97.58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NhhA outer membrane protein
                                                                                                                                                                                                                                                                                                                                                                                                   Matches 348; Conservative
                                                              PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                      Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                        SEQUENCE FROM N.A. STRAIN=NGE28;
                                                                                                                                                                     NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
          544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        534
                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                            Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q93QY4;
                                                              Q9JPS3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0930Y4
                                         RESULT 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0930Y4
          g
                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

```
ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300 LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157605; AAK68866.1; -.
InterPro; IRRO05594; YadA.
EMBL; AF157605; AAK68866.1; -.
SEQUENCE 594 AA; 62297 MW; 9DDD48B04B3A8EA2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-22491 / Serogroup A / Serotype 4A;
MEDLINE-2022555; PubMed=10761919;
Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C.,
Klee S.R., Morelli G., Basham D., Brown D., Chillingworth T.,
Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd S.,
Jagels K., Leather S., Moule S., Mungall K., Quail M.A.,
Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J.,
Whitchead S., Spratt B.G., Barrell B.G.;
"Complete DNA sequence of a serogroup A strain of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-0cr-2000 (TrEMBLrel. 15, Created)
01-0cr-2000 (TrEMBLrel. 15, Last sequence update)
01-0cr-2002 (TrEMBLrel. 22, Last annotation update)
Putative surface fibril protein (Outer membrane protein GNA992).
NMA1200 OR GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1;
           Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1753.5; DB 2; Length
Pred. No. 1.1e-78;
; Mismatches 5; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           592 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                   96.78;
Bacteria; Proteobacteria;
Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseriaceae; Neisseria.
NCBI_TaxID=65699, 487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
```

Ĥ

9

357 180 417 299

```
ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKK 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418 MDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDDEGALNVGSKD 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYQW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                     298 ENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTKVTFASGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINGE31;
MEDLINGE31;
MEDLINE-20175756;
PUBMed-10710308;
MISCAR M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Galcotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
           Savino S., Scarselli M., Storni E., Zuo P., Knapp B., Blair E., Mason T., Tettelin H., C., Saunders N.J., Granoff D.M., Venter C.,
                                                                                                                                                                                                                                                   DB 2; Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Proteobacteria; Betaproteobacteria; Neisseriales;
       Ratti G., Santini L., Savino S., Scarselli M., Storni E., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettel Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Ven Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B
                                                                                                                                                                                                                                               Ouery Match 96.6%; Score 1750.5; DB 2; Length Best Local Similarity 97.2%; Pred. No. 1.6e-78; Matches 347; Conservative 2; Mismatches 7; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62114 MW; 1E2A63A78F53D256 CRC64;
                                                                                                                                                                                                              62086 MW; 1B25E03B90D04B46 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
                                                                                                   Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
                                                                                                                                    EMBL; AF226376; AAF42525.1; -.
EMBL; AF226369; AAF42518.1; -.
Interpro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 594 AA; 62086 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AF226379; AAF42528.1; -. InterPro; IPR005594; YadA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseriaceae; Neisseria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pfam; PF03895; YadA;
SEOUENCE 594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 15
             RA
RA
RA
RT
RT
DR
DR
DR
SO
SO
                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGT 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TATVSKDDQGNITVMYDVNVGDALAVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             357 TATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NKPVRITHNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
REGUENCE FROM N.A.

SEQUENCE FROM N.A.

SEGUENCE FROM N.A.

SEGUENCE FROM N.A.

STRAIN-205900, B2133, F6124, AND 22491;

MEDLINE-20175756; Pubmed-10710308;

A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Comenducti M., Jennings G.T., Baldi L., Bartolini E., Capecohi B.,

A Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

RA MOXON E.R., Grandi G., Rappuoli R.;

Tidentification of Vaccine Candidates Against Serogroup B

RM MIGOCOCCUS by Whole-Genome Sequencing.";

Science 287:1816-1820(2000)

DR EMBL, AF226357; AAF42514.1;

DR EMBL, AF226357; AAF42522.1;

DR EMBL, AF226386; AAF42532.1;

DR EMBL, AF226386; AAF42532.1;

DR EMBL, AF226386; AAF42535.1;

DR FMBL, PP08895; YadA;

Pfan, PP08895; YadA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGD-ALNVGSKKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGHFGASASVGYOW 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-NG3/88, and B2232;
MEDILNE-20175756; PubMed=10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 16; Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; Betáproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1752.5; DB 16; Lengt
Pred. No. 1.2e-78;
3; Mismatches 5; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                  61745 MW; AD22E2F5EEF8F754 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Outer membrane protein GNA992.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    96.78;
97.58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity 97.5
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                  592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09JPI3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9JPI3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9JPI3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

```
38 DNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 297
                                                                                                                                        240 DNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAY 299
                                                                                                                                                                                                                        121 TTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGK 180
                                                                                                                                                                                                                                                     1 NNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG
                     1;
   Length 594;
Score 1750.5; DB 2; Length
Pred. No. 1.6e-78;
2; Mismatches 7; Indels
 Query Match 96.6%;
Best Local Similarity 97.2%;
Matches 347; Conservative
                                                                                                                                                                                                                                 셤
                                                             셤
                                                                                    õ
                                                                                                      g
                                                                                                                                              q
                                                                                                                                                                   ò
                                                                                                                                                                                     g
                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                      ŏ
                                                                                                                           δ
```

Search completed: October 6, 2003, 09:30:53 Job time : 28.1469 secs

A surface protein BASB029 amino acid N. meningitidis EG

meningitidis PM

A surface protein
N. meningitidis H3
A surface protein
N. meningitidis H3
A surface protein
N. meningitidis H4
A surface protein
N. meningitidis H1
N. meningitidis B2
N. meningitidis P2
N. meningitidis P2
N. meningitidis P2
N. meningitidis P3
N. meningitidis P4
N. meningitidis P

```
Surface antigen NhhA; meningococcal disease; meningitis vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1..51
/label= Signal_peptide
52..433
/label= Mature_NhbA_deletion_mutant_#3
/note= "Predicted mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis PMC21 NhhA deletion mutant #3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALIGNMENTS
                AAY23740
AAY57044
AAY57044
AAY23743
AAU06176
AAU06183
AAU06183
AAU06177
AAU06178
AAU06178
                                                                                                                                                                                                                                                                     AAY23745
AAU06173
AAU06184
                                                                                                                                                                                                                                                                                                                                                AAB23858
AAR99393
AAB23860
AAB37832
AAR99394
                                                                                                                                                                                                                                                                                                                                                                                                                                             AAB23854
AAB23857
AAB23856
AAB23856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY27201
AAB37830
ABP71294
AAB69136
                                                                                                                                                                                                                                                                                                                 AAU06181
AAR99392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis strain PMC21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAU06185 standard; Protein; 433 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25-JAN-2000; 2000US-0177917
   mutant; mutein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-AUG-2001
1886.5
1886.5
1886.5
1881.5
1881.5
1881.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
1861.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
187.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 1
    Amino acid sequenc
A surface protein
A surface protein
N. meningitidis PM
M. meningitidis EG
BASB029 amino acid
A surface protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N. meningitidis PM
N. meningitidis PM
                                                                                                                            alignments)
Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A.ceneseq_190unos:

SIDSI/gcgdata/geneseq/geneseqp-embl/AA1980.DAT:*

SIDSI/gcgdata/geneseq/geneseqp-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseq/geneseqp-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1982.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1989.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1989.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1981.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1992.DAT:*

SIDSI/gcgdata/geneseqy-embl/AA1999.DAT:*

                                                                                                          Search time 32.8045 Seconds
                                                                                                                                                                                                       1 NRAASVKDVLNAGWNIKGVK.....TASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /SIDS1/gcgdata/geneseq/geneseqp-emb1/AA2001.DAT:*/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA2002.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /SIDS1/gcgdata/geneseq/geneseqp-emb1/AA2003.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Description
                                                                                                                                                                                                                                                                                                                  1107863
                 5.1.6
Compugen Ltd.
                                                                                                                            (without 1848.329
                                                                                                                                                                                                                                                                                                               Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                  1107863 seqs, 158726573 residues
                 version :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUMMARIES
                                                                                                           6, 2003, 09:05:45;
                                                                                                                                                                                                                                                                                                                                                                                              Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAY27202.
AAY23741
AAY23746
AAU06171
AAU06175
AAY57045
                                                                              protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06185
                                                                                                                                                                                                                                    BLOSUM62
Gapop 10.0 , Gapext 0.5
                 GenCore (c) 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                            A_Geneseq_19Jun03:*
                                                                                                                                                                                                                                                                                                                                                length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      015500055
                                                                                                                                                                        US-09-771-382-38
1947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     591
591
591
591
591
                                Copyright
                                                                                                           October
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7.000
7.7.000
7.7.000
7.000
7.000
7.000
8.000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
```

1941 1941 1941 1941 1941 1938

Result õ

Haemophilus influe Haemophilus influe Haemophilus influe Amino acid sequenc Neisserial conserv

catarrhalis sur

Haemophilus influe Haemophilus influe

Haemophilus adhesi

sed

Minimum DB Maximum DB

Database

Title: Perfect score:

sednence:

OM protein

Run on:

Scoring table:

Searched:

a

```
302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                   Peptide
                                                                        Protein
                                          Key
  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              òγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Óλ
                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                            111
                                                                                                                                                                                                                                                                                                                                                                                TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTA 120
                                                                                                                                                                                                                                                                                                                                                                                             NGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #3.
                                                                                                                                                                                                                                                                                                                                       1 NRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK
                                                                                                                                                                                                                                                                                                                                                   241 VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                            meningitidis mutant polypeptides of the surface antigen NhhA
(AAU06182-AAU06186). The modified or mutant NhhA polypeptides are
characterised by deletions of non-conserved amino acids, particularly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                    or
                                                                     New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                     present invention relates to the isolation of novel Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface antigen NhhA; meningococcal disease; meningitis vaccine; mutant; mutein.
                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                             100.0%; Score 1947; DB 22; Length 433; 100.0%; Pred. No. 6.5e-122; Live 0; Mismatches 0; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N. meningitidis PMC21 NhhA deletion mutant #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGTASGNSRGHFGASASVGYOW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAU06182 standard; Protein; 512
                                                                                                                 Claim 12; Fig 8; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                    Conservative
(UYQU ) UNIV QUEENSLAND
                   Peak IRA, Jennings MP;
                                      2001-488774/53
                                                                                                                                                                                                                                                                                                        Local Similarity
nes 382; Conserv
                                                                                                                                                                                                                                                                          433 AA;
                                       WPI; 2001-488774/
N-PSDB; AAS09175.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAU06182;
                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               412
                                                                                                                                                                                                                                                                                                           Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAU06182
ò
                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

```
EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh AMUGORBS 2-AMUGORBS. The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                           52..512
/label= Mature_NhhA_deletion_mutant_#1
/note= "Predicted mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 512;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99.7%; Score 1941; DB 22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred, No. 2e-121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100.0%; Pred. ...
                                                                                                                                         /label= Signal_peptide
meningitidis strain PMC21.
                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 12; Fig 5; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 381; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        512 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB; AAS09172
                                                                                                                                                                                                                                                                                                                    WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                            02-AUG-2001
Neisseria
Synthetic.
```

ö

m

Page

450 301

```
302 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                   SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present sequence represents a surface protein of Neiserria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis surface proteins useful for treating meningitidis infections
                                                                                                                                                                                                                                                                                                                               surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1941; DB 20;
Pred. No. 2.4e-121;
0; Mismatches 0;
                                                                                                                                                                                                                                                                                                      A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 1; Page 104-106; 132pp; English.
                                                                                                                                                                                                                               Ą.
                                                                                                                                       GTASGNSRGHFGASASVGYOW 382
                                                                                                                                                     Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99.7%; Scc.
100.0%; Pre
                                                                                                                                                                                                                             AAY23741 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                              98WO-AU01031
                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                                              immunoreactive peptide
                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1999-418754/35.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity
Matches 381; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591 AA;
                                                                                                                                                                                                                                                                                                                                 Surface protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAX85793
                                                                                                                                                                                                                                                                                                                                                                                              W09931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                              14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-DEC-1997;
                                                                                                                                                                                                                                                                               08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                       24 - JUN - 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                             451
                                                                                                                                                                                                                                                      AAY23741:
             391
                                      242
                                                                                                                                        362
                                                                                                                                                                571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                  AAY23741
                                                                                                                                                                                                      RESULT
                                                                                                                                                                                                                                                        ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                    ò
                                                             Db
                                                                                      ò
                                                                                                            qq
                                                                                                                                         ò
                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The invention provides proteins (AAY27201-245) from Neisseria meningitidis (Strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial bacteria, especially Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                             Neisseria meningitidis protein; pharmaceutical; vaccine; diagnosis; bacterial infection; treatment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisseria meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99.7%; Score 1941; DB 20; Length 591; 100.0%; Pred. No. 2.4e-121; ive 0; Mismatches 0; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                              Scarlato V;
                                                                                                                                                                                                      Amino acid sequence of N. meningitidis protein ORF40-1
                                                                                                                                                                                                                                                                                                                                                                                                                                              Rappuoli R,
                                                                                                                                                                                                                                                                                                                                                                                                                                              Pizza M,
                                                   Ä.
                                      GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English.
                                                                                                                           AAY27202 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                   98GB-0022143.
98GB-0000760.
98GB-0019015.
                                                                                                                                                                                                                                                                                                                                             99WO-IB00103
                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 1; Page 62; 123pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                              Masignani V,
                                                                                                                                                                                                                                                                   Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1999-444400/37, N-PSDB; AAX99124.
                                                                                                                                                                                                                                                                                                                                                                                                                       CHIR-) CHIRON SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       591 AA;
                                                                                                                                                                                                                                                                                           W09936544-A2
                                                                                                                                                                            24-SEP-1999
                                                                                                                                                                                                                                                                                                                                            14-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                     09-0CT-1998;
                                                                                                                                                                                                                                                                                                                                                                                14-JAN-1998;
01-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local s-
                                                                                                                                                                                                                                                                                                                   22-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                              Grandi G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
             432
                                    362
                                                            492
                                                                                                                                                    AAY27202;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Loc
Matches
                                                                                                  RESULT 3
                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
             셤
                                      ò
                                                             용
```

ö

270

	Be.	- s	
GQTGQADKFETYISGINYTFASGKGTTAIYYKDDQGALTYMKDVNVGDALNYNQLQASGW 181 	QQ Dp	2 RAASVKDVLN 211 RAASVKDVLN	RAASYKDYLNAGWNIKGYKPCTTASONVDFVRTYDTVEFLSADTKTTTVNVESKONGKKT 61
NLDSKAVAGSSGKVISGNVSPSKGKADETVNINAGNNIETTRNGKNIDIATSMTPQFSSV 241 	QV	62 EVKIGAKTSV 271 EVKIGAKTSV	EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301 	QQ DP	122 GQTGQADKFE' 331 GQTGQADKFE'	GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361 	Qy	182 NLDSKAVAGS: 391 NLDSKAVAGS:	NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
GTASGNSRCHFGASASVGYQW 382 	QQ	242 SLGAGADAPTI 451 SLGAGADAPTI	SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
T 5 30003746 ctandama, protests, 601 as	Oy Dp	302 DNVDGNARAG: 	DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
	QY	362 GTASGNSRGHI 	GTASGNSRGHFGASASVGYQW 382
08-SEP-1999 (first entry)	2	4	3
protein of Neisseria meningitidis.	RESULT 6	T 6	
Surface protein; surface glycoprotein; infection; vaccine; immunoreactive peptide.	XX ID	06171 standard;	Protein; 591 AA.
Neisseria meningitidis.	X X		
WO9931132-A1.	TOX	24-OCT-2001 (first	ntry)
24-JUN-1999,	XX	_	surface antigen NhhA polypeptide seq
14-DEC-1998; 98WO-AU01031.	XX		meningoc
12-DEC-1997; 97GB-0026398.	S XX	eisseria mening	is strain PMC21.
ISIS INNOVATION LTD. UNIV QUEENSLAND.	HEE	Key Loca Peptide 1! /lab	ocation/Qualifiers .51 /label= Signal_peptide
Jennings MP, Moxon ER, Peak IRA;	FT	Region 1	
WPI; 1999-418754/35. N-PSDB; AAX85798.	1444	/note= Region 5110 /label	/note= "Conserved region I" 2108 /jahal= Vi
Neisseria meningitidis surface proteins useful for treating N.	TE	/ rubca // note= Protein 5259	ote="variable region 1"591
meningitidis infections Claim 1; Page 127-128; 132pp; English.		/label /note=	/label= Mature_NnA /note= "predicted mature protein, specifically claimed in claim 12"
sequence represents a surface protein of Neiserria	E E	Region 109.	
meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally		/not Region 121	/note= "Conserved region 2" 121124
by polymerase, or antibodies are useful in a Kit for on or diagnosis of N. meningitidis infection in humans.	T E E		/label= V2 /note= "Variable region 2"
Jacturs surface glycoprocess can also be used to read N. meningitidis infection in humans, especially of vaccines. The proteins and antibodies can also		kegion 125. /lab	125188 Tabel= Carved region 3" /note= "Conserved region 3"
to identify immunoreactive peptides.	FT	Region 189.	
591 AA;	FI	/not	/note= "Variable region 3"
99.7%; Score 1941; DB 20; Length 591;	FT		/label= C4

Ŋ

```
GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    W0200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak IRA,
          362
                                                                                            AAU06175;
                                                                                                                                                                                           Key
Region
                                                                                                                                                                                                                              Region
                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                  Region
                                                                                                                                                                                                                                                                                                                                                                         Region
                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                                                                                                             Region
                                                                 AAU06175
                                                         RESULT
                                                                                            Óλ
                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                        The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhA (AMU061192-AMU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain PMC21 is 1 of 10 NhhA polypeptide sequences (AAU06111-A4006180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                   New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;
                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                      99.7%; Score 1941; DB 22;
100.0%; Pred. No. 2.4e-121;
ive 0; Mismatches 0;
                                                       S
"Conserved region 4"
                           4
      230..236
/label= V4
/note= "Variable region 4
237..591
/label= C5
                                                       /note= "Conserved
                                                                                                                                                                                                                                                         Claim 9; Fig 1; 91pp; English.
                                                                                                              25-JAN-2001; 2001WO-AU00069
                                                                                                                                25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similaricy
hes 381; Conservative
                                                                                                                                                   (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                      Jennings MP;
 /note=
                                                                                                                                                                                                                                                                                                                                                                                                   the present invention.
                                                                                                                                                                                        WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                    591 AA;
                                                                                                                                                                                                  N-PSDB; AAS09161
                                                                          WO200155182-A1
                                                                                            02-AUG-2001
                                                                                                                                                                     Peak IRA,
                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                    Region
         Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
```

```
Neisseria meningitidis, useful in producing vaccines for treating or
preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are
                                                                                                                                                                                                                                     N. meningitidis EG329 surface antigen NhhA polypeptide sequence.
                                                                                                                                                                                                                                                                               Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New NhhA surface antigen polypeptides and polynucleotides from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= C2
/note= "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                      "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "Conserved region 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note= "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= V4
/note= "Variable region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label= v3
/note= "Variable region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= V2
/note= "Variable region
                                                                                                                                                                                                                                                                                                                      Neisseria meningitidis strain EG329
                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                    Ą.
/label= C3
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= C4
/note= "Conserved
                                                                                                                  AAU06175 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                                                                                                                                                                                                                       51..108
/label= v1
                                                                                                                                                                                               24-OCT-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                   1..50
/label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               . 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note=
                                                                                                                                                                                                                                                                                                                                                                                                                            'note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 2001-488774/53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-PSDB; AAS09165
```

```
121
                                                                                                                                                                                                                                                                                                                                     271 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 330
                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                        spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain EG329 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nisseria meningitidis; surface fibril protein; HSF; diagnosis;
n; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                                                                                                                                               EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                    RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                  GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                     NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader
                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BASB029 amino acid sequence from N. meningitidis strain H44/76
                                                                                                                                                                                               Length 591;
                                                                                                                                                                                                                          Indels
                                                                                                                                                                                             Score 1941; DB 22;
Pred. No. 2.4e-121;
0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           by ACA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    by AAC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          рy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ą.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99.7%; Scc.
100.0%; Pre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY57045 standard; Protein; 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'note= "Encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Neisseria meningitidis.
                                                                                                                                           the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Misc-difference 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference 123
                                                                                                                                                                                                            Similarity
                                                                                                                                                                    591 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21-FEB-2000
                                                                                                                                                                                                  Ma.
Local 5.
381;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                infection;
                                                                                                                                                                                                                                                    ~
                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAY57045;
                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                          331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                571
                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 8
 a
                                                                                                                                                                                                                                                                                                                                   qq
                                                                                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

```
serogroup B strain H44/76. The BASB029 protein is homologous to the laemophilus influenzae surface fibril (HSP) protein. The invention relates to BASB029 proteines of AA239665. The invention relates to BASB029 prolucides sequences (AAX39664-Z39865) and colypeptide sequences (AAX3964-Z39865) and colypeptide sare useful in a method of diagnosing a Neisseria maniputidis infection in a mammal. Compositions containing BASB029 colypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria manigitidis disease. The polynuclectide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynuclectide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 colynuclectides and polypeptides are also useful for treating in fections particularly bacterial infections. The protein is useful in the combinant screening and development of antibacterial drugs. Fused recombinant continuation is useful for the stimulation of the immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                     is the Nisseria meningitidis BASB029 amino acid sequence from
                                                                                                                                                                                                                                                                                                                                                             New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99.5%; Score 1938; DB 21;
99.7%; Pred. No. 3.8e-121;
ive. 1; Mismatches 0;
                                                                                                                                                                                                                                     (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                note= "Encoded by
                                                    /note= "Encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                   2; 74pp; English.
                                                                                                                                                                                                  98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative,
                                                                                                                                                                                                                                                                                                         WPI; 2000-053103/04
Misc-difference 269
                                   Misc-difference 389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity
Matches 380; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   591 AA;
                                                                                                                                                                                                                                                                                                                             N-PSDB; AAZ39865
                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 4; Fig
                                                                                         WO9958683-A2
                                                                                                                                                                                                  13-MAY-1998;
                                                                                                                                                                                                                                                                         Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ă
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ά
```

ô

301 511

```
302 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                          meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #4.
                                                     New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention relates to the isolation of novel Neisseria
                                                                                                                                                                                                                                                                                                                                                     Surface antiqen NhhA; meningococcal disease; meningitis vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= Signal_peptide
50..502
/label= Mature_Nhha_deletion_mutant_#4
/note= "predicted mature protein, specifically
claimed in claim 12"
                                                                                                                                                                                                                                                                                                                         N. meningitidis PMC21 NhhA deletion mutant #4.
                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis strain PMC21.
Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                             Ä.
                                                                                                                                                               GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                            AAU06186 standard; Protein; 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 12; Fig 9; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-JAN-2001; 2001WO-AU00069.
                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2001-488774/53.
N-PSDB; AAS09176.
                                                                                                                                                                                                                                                                                                                                                                    mutant; mutein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO200155182-A1.
                                                                                                                                                                                                                                                                                                24-0CT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      02-AUG-2001
                                                                                                                                                                                                                                                                     AAU06186;
             392
                                                                                                                      512
                                                                                                                                                 362
                                                                                                                                                                                                                                                                                                                                                                                                                                      Key
Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein
                                                                                                                                                                                                                              AAU06186
                                                                                                                                                                                                                                                                       Ω
                                                                Dp
                                                                                          ά
                                                                                                                  qq
                                                                                                                                                 ò
                                                                                                                                                                         Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerse, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis surface proteins useful for treating N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 592;
                                                                                                                                                                                                                                           Surface protein; surface glycoprotein; infection; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1937; DB 20;
Pred. No. 4.4e-121;
0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         be used to identify immunoreactive peptides.
                                                                                                                                                                                                                A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 1; Page 86-87; 132pp; English.
                                                     AAY23737 standard; Protein; 592 AA
                                       GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          99.5%;
ilarity 99.7%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                98WO-AU01031.
                                                                                                                                                                                                                                                                                                                                                                                           97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                    (ISIS-) ISIS INNOVATION LTD. (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        meningitidis infections
                                                                                                                                                                                                                                                         immunoreactive peptide.
                                                                                                                                                                                                                                                                                  Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1999-418754/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB; AAX85788
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jennings MP,
                                                                                                                                                                                                                                                                                                           WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                           12-DEC-1997;
                                                                                                                                                                                     08-SEP-1999
                                                                                                                                                                                                                                                                                                                                      24-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     380;
                                                                                                                                                            AAY23737;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
            511
                                       362
                                                                571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Seguence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Loca
Matches
                                                                                                                      AAY237
                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
            g
                                       ò
                                                                9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

or,

œ

1;

X S

ò g δ g õ g ŏ q

ò g ò qq

ò g

```
452
                                                                                                                                                                                                                     272
                                                                                                                                                                                                                                                                     332
                                                                                                                                                                                                                                                                                                                       392
                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis; infection; treatment; prevent; antibacterial drug.
                                                                                                                                                                                                                                                           IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRCEAGYAIGYSSISDGGNWII
                                                                                                                                                                                          RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                     213 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRT
                                                                                                                                                                                                                                             EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                     Gaps
meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BASB029 amino acid sequence from N. meningitidis strain ATCC13090
                                                                                                                                        Score 1886.5; DB 20; Length 594;
Pred. No. 1e-117;
3; Mismatches 5; Indels 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Encoded by AATC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (SMIK ) SMITHKLINE BEECHAM BIOLOGICALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ą
                                                                                                                                           96.9%;
97.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY57044 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99WO-EP03255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98GB-0010276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entry)
                                                                                                                                                     al Similarity 97.6
373; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first
                                                                                                                 594 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W09958683-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             07-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Neisseria
                                                                                                                                                                                                                                                                                                                                                                         393
                                                                                                                                                                                              C)
                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY57044;
                                                                                                                    Seguence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             513
                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                        333
                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                                            453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           573
                                                                                                                                           Query Match
Best Local 9
                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY57044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                  QQ
                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                       qq
                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                             180
                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                               300
                                                                                                                180
                                                                                                                                           120
                                                                                                                                                                    240
                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                            TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTA
                                                                                                                                                                                                                                             WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                                                                                                                                                                                                                               VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                        NRAASVKDVLNAGWNIKGVKPGTIASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK
                                                                  Gaps
                                                                7;
                                       Length 502;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence represents a surface protein of Neiserria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein; surface glycoprotein; infection; vaccine;
                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                         DB 22;
                                                                  ö
                                      Score 1891.5; DB 2
Pred. No. 3.9e-118;
1; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis surface proteins useful meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A surface protein of Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Page 100-101; 132pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                    KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                 Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Peak IRA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAY23740 standard; Protein; 594
                                       97.1%;
97.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INNOVATION LTD.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                              374; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (ISIS-) ISIS INNOVATION (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     immunoreactive peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 1999-418754/35.
                                                     Similarity
               A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB; AAX85792
               502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings MP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-JUN-1999
                                                                                        -
                                                                                                                                                                                                                     241
                                                                                                                                                                 181
                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 1;
               Sequence
                                         Query Match
Best Local (
                                                                                                                 128
                                                                                                                                         61
                                                                                                                                                                                            121
                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY23740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface
                                                               Aatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAY23740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
```

```
Sequence
                                                                          Key
   This is the Nisseria meningitidis BASB029 amino acid sequence from serogroup B strain ATCC13090. The BASB029 protein is homologous to the Haemophilus influenzea surface fibril (HSF) protein. The invention relates to BASB029 polynucleotide sequences (AAX57044-Y57045) and their immunogenic fragments. PASB029 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASB029 colynucleotides and polypeptides are useful for generating an immune compose in an animal. A therapeutic composition comprising an antibody directed against BASB029 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the confoundation increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASB029 computed or development of antibacterial drugs. Pused recombinant confounce by protein is useful in the immune system of an organism
                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                      EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1; Gaps
                                                  New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
                                                                                                                                                                                                                                                                                                                                                   Score 1886.5; DB 21; Length 594;
Pred. No. 1e-117;
3; Mismatches 5; Indels 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAU06174 standard; Protein; 594 AA.
                                                                                 Claim 4; Fig 2; 74pp; English.
                                                                                                                                                                                                                                                                                                                                                    96.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-OCT-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                 Query Match 96.9
Best Local Similarity 97.6
Matches 373; Conservative
                                                                                                                                                                                                                                                                                                          receiving the protein.
                  WPI; 2000-053103/04.
                                                                                                                                                                                                                                                                                                                              594 AA;
                              N-PSDB; AAZ39864
                                                                                                                                                                                                                                                                                                                                Seguence
Ruelle J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       573
                                                                                                                                                                                                                                                                                                                                                                                                                213
                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                          273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAU06174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAU06174
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            UXXXI
                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                     å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  윱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
```

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh ANUOGAIS-AAUOGAISO. The modified or mutant Nhhh Polypeptides are characterised by deletions of non-conserved maino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain E3327 is 1 of 10 Nhha Polypeptide sequences that the contract of the contract 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis .
N. meningitidis EG327 surface antigen NhhA polypeptide sequence.
                                                                                     Surface antigen NhhA; meningococcal disease; meningitis vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= C4
/note= "Conserved region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= C3
/note= "Conserved region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label= C2
/note= "Conserved region 2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /label= C5
/note= "Conserved region 5"
                                                                                                                                                                                                                                                                                                                                                                                                "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= V1
/note= "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label= V4
/note= "Variable region 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Variable region 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= V2
/note= "Variable region
                                                                                                                                                                           Neisseria meningitidis strain EG327
                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          člaim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JAN-2001; 2001WO-AU00069.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25-JAN-2000; 2000US-0177917.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= V3
                                                                                                                                                                                                                                                                                                              l..50
/label= Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ..190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ..238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ..126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91..212
                                                                                                                                                                                                                                                                                                                                                                                                                                             51..104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (UYQU ) UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                    /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2001-488774/53.
N-PSDB; AAS09164.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO200155182-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02-AUG-2001
                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Region
```

594 AA;

```
EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                           SLGAGADAPTLSVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                     IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                          GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                   RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                  NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                    Gaps
a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans the N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Surface antigen NhhA; meningococcal disease; meningitis vaccine
                                                                                              Length 599;
                                                                                                                    ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis H38 surface antigen NhhA polypeptide sequence.
                                                                                                                    Indels
                                                                                              DB 20;
                                                                                              Score 1881.5; DB 2
Pred. No. 2.3e-117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label= C3
/note= "Conserved region 3"
196..217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Conserved region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
                                                                                                                    1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Variable region 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region
                                                                                                                                                                                                                                                                                                                                                                                               KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ą.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label= C2
/note= "Conserved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neisseria meningitidis strain H38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label= V2
/note= "Variable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU06176 standard; Protein; 599
                                                                                              96.6%;
ilarity 97.6%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1..50
/label= C1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ..131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         51..105
/label- 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
                                                                                                         Local Similarity
nes 373; Conserv
                                                                          599 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-OCT-2001
                                                                                                                                                             218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAU06176;
                                                                           Sequence
                                                                                                                                                                                  62
                                                                                                                                                                                                      278
                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                              338
                                                                                                                                                                                                                                                                                       398
                                                                                                                                                                                                                                                                                                                                458
                                                                                                                                                                                                                                                                                                                                                                          518
                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                               Query Match
                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Region
                                                                                                          Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 1
   888888888
                                                                                                                                                            q
                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                        QQ
                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                    qq
                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                     δy
                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                         272
                                                                                                                                                                                  241
                                                                                              EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                          181
                                                                                                                                                    452
                                                                                                                                                                                                                           SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                  IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                                                                                       572
                                                                GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                            RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally
                                  ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria meningitidis surface proteins useful for treating
             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Surface protein; surface glycoprotein; infection; vaccine;
                                  Indels
             22;
           Score 1886.5; DB 22
Pred. No. 1e-117;
3; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 A surface protein of Neisseria meningitidis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 1; Page 114-115; 132pp; English.
                                                                                                                                                                                                                                                                                                                      KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                     Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRA;
                                                                                                                                                                                                                                                                                                                                                                                    AAY23743 standard; Protein; 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Peak
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LTD.
            96.98;
97.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97GB-0026398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98WO-AU01031
                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ISIS INNOVATION UNIV QUEENSLAND.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         meningitidis infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Jennings MP, Moxon ER,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 immunoreactive peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-418754/35.
N-PSDB; AAX85795.
                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                           08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO9931132-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-JUN-1999
                                 373;
                                                                         213
                                                                                                                                                                                 182
                                                                                                                                                                                                                          242
                                                                                                                                                                                                                                                                                                                                                                                                        AAY23743;
                                                                                              62
                                                                                                                                       122
                                                                                                                                                                                                                                             453
                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (ISIS-)
             Query Match
Best Local (
                               Matches
                                                                                                                                                                                                                                                                                                                                                                RESULT 14
                                                                                                                                                                                                                                                                                                                                                                           AAY23743
                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                     g
                                                                                                                                                          g
                                                                                                                                                                                 ò
                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                               원
                                                                        g
                                                                                              ò
                                                                                                                   g
                                                                                                                                       ò
```

```
241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242 SLGAGADAPTLSVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh AMMONGES. AANUGOIRS). The modified or mutant NhhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain H38 is 1 of 10 NhhA polypeptide sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                         New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 22; Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1881.5; DB 2
Pred. No. 2.3e-117;
1; Mismatches 7;
/label= V3
/note= "Variable region 3"
218.236
/label= C4
/note= "Conserved region 4"
237..243
                                                                                                  244..599
/label- C5
/note- "Conserved region 5"
                                                             237..243
/label= V4
/note= "Variable region 4"
                                                                                                                                                                                                                                                                                                                                                                                                             Claim 9; Fig 1; 91pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 96.6%;
Best Local Similarity 97.6%;
Matches 373; Conservative
                                                                                                                                                                                                             25-JAN-2001; 2001WO-AU00069
                                                                                                                                                                                                                                      25-JAN-2000; 2000US-0177917
                                                                                                                                                                                                                                                                (UYQU ) UNIV QUEENSLAND
                                                                                                                                                                                                                                                                                          Peak IRA, Jennings MP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the present invention.
                                                                                                                                                                                                                                                                                                                   WPI; 2001-488774/53.
N-PSDB; AAS09166.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       599 AA;
                                                                                                                                                          WO200155182-A1
                                                                                                                                                                                    02-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                           Region
                                                                Region
                                                                                                        Region
 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

THIS PAGE BLANK (USPTO)

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

6, 2003, 09:14:45 ; Search time 10.2154 Seconds
(without alignments)
1582.188 Million cell updates/sec October Run on:

US-09-771-382-38 1947 1 NRAASVKDVLNAGMNIKGVK.....TASGNSRGHFGASĄSVGYQW 382 Title: Perfect score: Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

328717 Total number of hits satisfying chosen parameters:

328717 seqs, 42310858 residues

Searched:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

Issued_Patents_AA:*
: /cgn2_6/ptodata/1/iaa/5A_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*
: /cgn2_6/ptodata/1/iaa/PcTuS_COMB.pep:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

STIMMARTES

		op			SUMMARIES	
Result No.	Score	Query Match	Query Match Length DB	DB	ID	Description
1	1941	99.7	591		US-09-377-155-11	Sequence 11, Appl
7	1941	99.7	591	m	US-09-377-155-21	21,
m	1941	7.66	591	4	US-09-669-974-11	11,
4	1941	99.7	591	4	US-09-669-974-21	21.
ហ	1937	99.5	592	m	US-09-377-155-2	2, 7
9	1937	99.2	592	4	US-09-669-974-2	7
7	1886.5	6.96	594	m	US-09-377-155-9	Sequence 9, Appli
80	1886.5	6.96	594	4	US-09-669-974-9	6
6	1881.5	96.6	599	٣	US-09-377-155-15	15,
10	1881.5	9.96	599	4	US-09-669-974-15	15,
11	1874.5	96.3	594	e	US-09-377-155-7	7.7
12	1874.5	96.3	594	4	US-09-669-974-7	7
13	1861.5	92.6	592	m	US-09-377-155-17	Sequence 17, Appl
14	1861.5	95.6	592	4	US-09-669-974-17	17,
15	1861.5	92.6	598	m	US-09-377-155-5	Sequence 5, Appli
16	1861.5	95.6	598	٣	US-09-377-155-13	13
17	1861.5	95.6	598	4	US-09-669-974-5	Sequence 5, Appli
18	1861.5	92.6	598	4	US-09-669-974-13	13,
19	1817.5	93.3	589	٣	US-09-377-155-19	19,
20	1817.5	93.3	589	₹	US-09-669-974-19	19,
21	710	36.5	1098		US-08-409-995-2	7,7
22	710	36.5	1098	٣	US-08-685-467-2	Sequence 2, Appli
23	710	36.5	1098	٣	US-09-377-155-32	32,
24	710	36.5	1098	m	US-08-913-942-2	2
25	710	36.5	1098	4	US-09-669-974-32	32,
56	710	36.5	1098	4	-09-268-347	44,
27	692	35.5	658	П	US-08-409-995-5	Sequence 5, Appli

Sequence 5, Appli Sequence 5, Appli	32,	Sequence 33, Appl	4, A	33,	36,	Sequence 47, Appl	4	4	Sequence 6, Appli	9	9	15,	Sequence 26, Appl	Sequence 24, Appl	Sequence 30, Appl	Sequence 28, Appl
US-08-685-467-5 US-08-913-942-5	US-09-268-347-32	US-09-377-155-33	US-08-913-942-4	US-09-669-974-33	US-09-268-347-36	US-09-268-347-47	US-08-409-995-4	US-08-685-467-4	US-08-409-995-6	US-08-685-467-6	US-08-913-942-6	US-08-913-942-15	US-09-268-347-26	US-09-268-347-24	US-09-268-347-30	US-09-268-347-28
ოო	4	٣	m	4	4	4	-	٣	П	ო	m	m	4	4	4	4
658 658	1094	2353	2353	2353	2411	2354	1912	1912	607	607	607	619	619	1002	1004	1104
35.5	35.5	33.9	33.9	33.9	33.9	33.9	32.6	32.6	31.5	31.5	31.5	24.2	24.2	21.3	20.9	20.1
692 692	690.5	099	099	099	099	659.5	635	635	612.5	612.5	612.5	470.5	470.5	414.5	406	392
28	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

ALIGNMENTS

	0;	61 270	121 330	181 390	241 450	301 510	361
RESULT 1 US-09-377-155-11 Sequence II, Application US/09377155 Patent No. 6197312 GENERAL INPORMATION: APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/00128 CURRENT APPLICATION NUMBER: US/09/377,155 CURRENT FILING DATE: 1999-08.19 PRIOR PILING DATE: 1999-08.19 PRIOR PLILING DATE: 1999-12-14 PRIOR FILING DATE: 1999-12-14 SOFTWARKE: PATENTIN NUMBER: GB 9726398.2 NUMBER OF SEQ ID NOS: 33 SOFTWARKE: PATENTIN VET. 2.0 SEQ ID NO 11 TYPE: PRT ORGANISM: Neisseria meningitidis	Query Match 99.7%; Score 1941; DB 3; Length 591; Best Local Similarity 100.0%; Pred. No. 1.8e-150; Matches 381; Conservative 0; Mismatches 0; Indels 0; Gaps	PGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT 	62 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 12. 	122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 18. 	182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 24.	242 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKGGDVTNVAQLKGVAQNLNNRI 30: 	302 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 36:
N N D D	Query N. Best Lc Matches						
S D C C C C C C C C C C C C C C C C C C		Qy Op	Qy Db	QY	Qy Db	QY	QY

ö

```
US-09-669-974-21
                                                                                                                                                                             SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                         271
                                                                                                                                                                                                                                                                                                                                                                                                                                                       122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                         qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
 511 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   331 GOTGOADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ouery Match 99.7%; Score 1941; DB 3; I Best Local Similarity 100.0%; Pred. No. 1.8e-150; Matches 381; Conservative 0; Mismatches 0;
                                                                                                                                                                                  APPLICANT: DEAK, Tan Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard Title OF INVENTION: NOVEL SUFFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VET. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 11, Application US/09669974
Patent No. 6333173
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
                                362 GTASGNSRGHFGASASVGYQW 382
                                                 GTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTASGNSRGHFGASASVGYOW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 21, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                      ; ORGANISM: Neisseria meningitidis US-09-377-155-21
                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                         SEQ ID NO 21
LENGTH: 591
                                                            571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
qq
                                                           g
                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
```

```
ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                              Score 1941; DB 4; I
Pred. No. 1.8e-150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .
0
                                                                                                                                                                                                                                                                                                                                                                                             99.7%; Scor.
100.0%; Pred. No. ...
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-09-99-914-21;
Sequence 21, Application US/0966974
Patent No. 6333173
GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
ITLE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT APPLICATION NUMBER: US/09/669,974
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 21
LENGTH: 591
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR PLICATION NUMBER: GB 9726398.2
PRIOR PLICAGION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362 GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            571 GTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                   ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches 381; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                            Ouery Match
Best Local Similarity
```

m

```
451
                                                                                             301
                                                                                                                       511
                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                           SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                         NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GOTGOADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99.5%; Score 1937; DB 4;
99.7%; Pred. No. 3.8e-150;
Live 0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                           APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
ITILE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: DCT/AU98/01031
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
                                                                                                                                                                                                           GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                    572 GTASGNSRGHFGASASVGYOW 592
                                                                                                                                                                                                                                                                                                       ; Sequence 2, Application US/09669974
; Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Neisseria meningitidis
US-09-669-974-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 99.5
Best Local Similarity 99.7
Matches 380; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQ ID NOS: 33
PatentIn Ver. 2
                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                          US-09-669-974-2
                                                                   392
                                         182
                                                                                             242
                                                                                                                        452
                                                                                                                                                     302
                                                                                                                                                                               512
                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 2
                                         ò
                                                                  qq
                                                                                             ò
                                                                                                                       g
                                                                                                                                                     δ
                                                                                                                                                                               g
                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                   ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                450
                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19
                                                                                             61
                                                                                                                                                                                                                                                                             EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                          GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                  331 GOTGOADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                     SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                         DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                           RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                             NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                    Gaps
                                                                                                                                                                                                                       ö
                                                                   ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                   Indels
                                           Length
                                        // Match 99.7%; Score 1941; DB 4; I
Local Similarity 100.0%; Pred. No. 1.8e-150;
nes 381; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1937; DB 3;
Pred. No. 3.8e-150;
0; Mismatches 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: PEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TILE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: D599-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                 GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 2, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM: Neisseria meningitidis US-09-377-155-2
; ORGANISM: Neisseria meningitidis
US-09-669-974-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99.58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              380; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQ ID NOS:
SOFTWARE: Patentin Ve
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQ ID NO 2
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-377-155-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     212
                                         Query Match
                                                                                                                                                   62
                                                                                                                                                                             271
                                                                                                                                                                                                        122
                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                       391
                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                              451
                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                    511
                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          272
                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                             ð
                                                                                                                                                   ò
                                                                                                                                                                         qq
                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
```

ö

ò g

```
213 RAASVKDVLNAGWNIKGVKPCTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRT 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        273 EVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTAN 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                           ij
                                                                                                                                                                                                                                                                                                                                   Length 594;
                                                                                                                                                                                                                                                                                                                                                                           5; Indels
                                                                                                                                                                                                                                                                                                                                 Score 1886.5; DB 4;
Pred. No. 5.1e-146;
3; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TTLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: 05/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER: OF SEQ ID NOS: 33
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR PILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR PILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SEQ ID NO 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361 KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 15, Application US/09377155; Patent No. 6197312; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: PRT CRGANISM: Neisseria meningitidis US-09-377-155-15
                                                                                                                                                                                                                                                                            Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                 96.9%;
nilarity 97.6%;
Conservative 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PatentIn Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                    al Similarity
373; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER SOFTWARE: Pate SEQ ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -09-377-155-15
                                                                                                                                                                                                                                   LENGTH: 594
                                                                                                                                                                                                                                                                                          US-09-669-974-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      513
                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                        TYPE: PRT
                                                                                                                                                                                                                                                                            ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                        q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122 GOTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ouery Match
96.9%; Score 1886.5; DB 3;
Best Local Similarity 97.6%; Pred. No. 5.1e-146;
Matches 373; Conservative 3; Mismatches 5;
                                                                                                                                                                                                                      APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DOXON, E. Richard FILLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SEQ ID NO 9
SEQ ID NO 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 9, Application US/09669974
Patent No. 6333173
GENERAL INFORMATION:
APPLICANT: PERK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MXXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361 KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTASGNSRGHFGASASVGYQW 382
                                          572 GTASGNSRGHFGASASVGYOW 592
                                                                                                                                                                   Sequence 9, Application US/09377155 Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ORGANISM: Neisseria meningitidis
US-09-377-155-9
                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                US-09-377-155-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 8
US-09-669-974-9
                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TYPE: PRT
```

g

ò

q δ qq

ò

g

ò

g

δ

g

ð . q

ò

577

241

397

```
338 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGW
                             NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                         IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1874.5; DB 3 Pred. No. 4.9e-145;
                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: WOXON, E. Richard
ITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1; Mismatches
                                                                                                                                                                                                       KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                  Sequence 7, Application US/09377155
Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ORGANISM: Neisseria meningitidis US-09-377-155-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              96.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Local Similarity 97.4 Matches 372; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594
                             182
                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     513
                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE:
SEQ ID NO 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                     Д
                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                           Qγ
                                                    q
                                                                                ŏ
                                                                                                                                  οy
                                                                                                                                                                                       ογ
                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                             ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1;
                                                                                                                                                                                                                                                                                                                      337
                                                                                                                                                                                       397
                                                                                                                                                                                                              277
                                                                                                                                                            GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                        EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                       61
                                                   2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                  SLGAGADAPTLSVDG-DALNVGSKKDNRPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                  2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                              Gaps
                             ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ij
  DB 3; Length 599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1881.5; DB 4; Length
Pred. No. 1.3e-145;
1; Mismatches 7; Indels
                             Indels
Score 1881.5; DB 3
Pred. No. 1.3e-145;
1; Mismatches 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
FILE APPLICANT: MOXON, E. RICHARD
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-13
SOFTWARE: PATENTIN NUMBER: GB 9726398.2
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATENTIN VEY: 2.0
                                                                                                                                                                                                                                                                                                                                                                             KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                            Sequence 15, Application US/09669974 Patent No. 6333173 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>ب</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; ORGANISM: Neisseria meningitidis US-09-669-974-15
 96.6%;
97.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 96.6%;
Best Local Similarity 97.6%;
Matches 373; Conservative
                           Conservative
             Similarity
            Local Simi
                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 10
US-09-669-974-15
                                                                              218
                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                 278
                                                                                                        62
                                                                                                                                                                                     338
                                                                                                                                                                                                               182
                                                                                                                                                                                                                                          398
                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                    578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122
 Query Match
                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 278
               Best Loc
Matches
                                                                            g
                                                                                                       õ
                                                                                                                                g
                                                                                                                                                                                  g
                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                      ογ
                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                          ò
                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
```

ij

272 121 132 132 181 181 392 452 452 300 512

61

1;

g

```
241
                                                                                                                                                                                                                                                                                                                                                                                                                         EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPOFSSV
                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                      . '1
                                                                                                                                                                                                                                                          Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 4; Length 592;
                                                                                                                                                                                                                                                                                                      9; Indels
                                                                                                                                                                                                                                                               DB 3;
                                                                                                                                                                                                                                                          95.6%; Score 1861.5; DB 3; 96.9%; Pred. No. 5.6e-144; tive 2; Mismatches 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1861.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INCORDATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
ITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 06504/0128
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-14
SUMBER OF SEQ ID NOS: 33
SOFTWARE: PATCHIN VET. 2.0
                      PCT/AU98/01031
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/0103
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; Sequence 17, Application US/09669974
; Patent No. 6333173
                                                                                                                                                                                ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ORGANISM: Neisseria meningitidis US-09-669-974-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          95.6%;
                                                                                                NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 17
                                                                                                                                                                                                                                                                                 Best_Local Similarity 96.9
Matches 370; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-669-974-17
                                                                                                                                                              LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Pa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    213 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1874.5; DB 4; Length 594;
Pred. No. 4.9e-145;
1; Mismatches 8; Indels 1;
                                                                                                                               GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 06504/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1099-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR PILING DATE: 1999-08-19
PRIOR PILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-08-13
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PATCHIN VET. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 17, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
                                                                                            Sequence 7, Application US/09669974 Patent No. 6333173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Neisseria meningitidis US-09-669-974-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 96.3%;
Best Local Similarity 97.4%;
Matches 372; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-377-155-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 7
```

q δ g ó g δ q ò g

δ

g ò q

ò

```
time
                                                                                                                                                                                                                        Search (
                                         δ
                                                                    20
                                                                                              δ
                                                                                                                         qq
                                                                                                                                                      ò
                                                                                                                                                                                QQ
                                                                                                                                                                                                                           270
                                                                                                                                                                   241
                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                          NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                        RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           95.6%; Score 1861.5; DB 3; Length 598; llarity 96.3%; Pred. No. 5.7e-144; Conservative 3; Mismatches 10: TnAble 1
               Indels
Pred. No. 5.6e-144;
2; Mismatches 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael Paul
APPLICANT: JENNINGS, Michael
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
PRIOR FILING DATE: 1997-12-12
SOFTWARE: PATCHIN VOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                          571 KGTASGNSRGHFGASASVGYQW 592
                                                                                                                                                                                                                                                                                                                                                                           361 KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-377-155-5; Sequence 5, Application US/09377155; Patent No. 6197312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM: Neisseria meningitidis
Best Local Similarity 96.9%;
Matches 370; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
Matches 368; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-377-155-5
                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                         451
                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                               511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      277
                                                                   211
                                                                                              62
                                                                                                                        271
                                                                                                                                                   122
                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ID NO 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a
                                                                  a
                                                                                              ò
                                                                                                                        a
                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                     ô
                                                                                                                                                                          g
                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                             ŏ
                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

THIS PAGE BLANK (USPTO)

```
Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB seq
Maximum DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Title:
Perfect score:
                                                                                                                                                                                                                                                                                                            Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Post-processing: Minimum Match 0%
                                                                                                                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                on:
                                                                                                                                                                                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have score greater than or equal to the score of the result being predicted by analysis of the total score distribution.
                      1891.5
1886.5
1886.5
1881.5
                                                                                                                                                                                                                                                                                         Score
                                                                                             Published_Applications_AA:*

1: /cgn2_6/ptodata/2/pubpaa/P

2: /cgn2_6/ptodata/2/pubpaa/P

3: /cgn2_6/ptodata/2/pubpaa/U

4: /cgn2_6/ptodata/2/pubpaa/U

5: /cgn2_6/ptodata/2/pubpaa/U

6: /cgn2_6/ptodata/2/pubpaa/U

8: /cgn2_6/ptodata/2/pubpaa/U

9: /cgn2_6/ptodata/2/pubpaa/U

9: /cgn2_6/ptodata/2/pubpaa/U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          length: 0
                                                                                                                                                                                                                                                                                         Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-771-382-38
1947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BLOSUM62
     99.7
99.7
99.7
99.7
96.9
96.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              587654 seqs, 158212981 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              October 6, 2003, 09:31:05 ; Search time 19.136 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NRAASVKDVLNAGWNIKGVK.....TASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /cgn2_6/ptodata/2/phbpaa/US07_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/PCT_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US06_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US06_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US07_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/PCTUS_PUBCOMB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /cgn2_6/ptodata/2/pubpaa/US09A_PUBCOMB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /cgn2_6/ptodata/2/pubpaa/US08_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US08_PUBCOMB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /cgn2_6/ptodata/2/pubpaa/US09B_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US09C_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US09C_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10A_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10B_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10B_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10C_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10C_NEW_PUB.pep:*
                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                    /cgn2_6/ptodata/2/pubpaa/US60_PUBCOMB.pep:*
                                                                                                                                                                                                                                                                                           DВ
     US-09-771-382-38

US-09-771-382-25

US-09-771-382-35

US-09-771-382-33

US-09-771-382-33

US-09-797-862-11

US-09-797-862-11

US-09-771-382-1

US-09-771-382-2

US-09-771-382-2

US-09-771-382-2

US-09-771-382-4

US-09-797-862-9

US-09-797-862-9

US-09-797-862-9

US-09-797-862-15

US-09-797-862-15
                                                                                                                                                                                                                                                                                           IJ
                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (without alignments)
3158.312 Million cell updates/sec
                                                                                                                                                                                                                                                                                       Description
                           Sequence 38, Appl
Sequence 25, Appl
Sequence 33, Appl
Sequence 23, Appl
Sequence 33, Appl
Sequence 11, Appl
Sequence 1, Appli
Sequence 2, Appli
Sequence 2, Appli
Sequence 2, Appli
Sequence 9, Appli
Sequence 9, Appli
Sequence 4, Appli
                  sequence
sequence
sequence
sequence
sequence
sequence
                                                                                                                                                                                                                                                                                                                                                                                                printed,
```

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	
86.	186.5	27.	w	297	297	297	297	298	318.5	607.5	660	710	1736.5	1808	1810	m	\sim	m	m	\sim	\sim	m	\sim	\sim	m	m	m	1874.5	m	
				5	15.3	5	5	5	6	1.	Ψ	6.	89.2		ω.	ω.	w	ŗ	5	5	5	5	5	5	5	5	'n	σ.	٥.	
1222	915	2042	2039	1992	1992	1833	1833	2122	1778	201	2353	1098	604	356	407	589	589	592	598	598	598	598	592	592	541	513	462	594	594	
12	12	15	15	12	12	12	12	10	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
-10-193-764-3	0-193-764-	-10-192-584-	0-192-	-10-175-282-	-10-175-275-	ç	5	Ψ	-238-075-7	-771-38	-797-862-3	97-862-3	-771-382-1	-771-382-	-771-382-2	-771-382-	-797-	-771-382-	US-09-771-382-8	-771-	-797-862-	US-09-797-862-5	-771-382-	US-09-797-862-17	-771-382-	-771-382-	2	Ÿ	US-09-797-862-7	
37,	•	6	7,		ω	4	Sequence 4, Appli	9	749	39,	Sequence 33, Appl	32,	11,		25,	Sequence 3, Appli	19,	10,		7,	13,	5	Sequence 2, Appli	17,	34,	Sequence 24, Appl	36,	Sequence 9, Appli	Sequence 7, Appli	

ALIGNMENTS

```
γ
                                                                                                                                                                                                                                                                                                                                                                                                           ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-771-382-38
                                                                                                                                  밁
                                                                                                                                                                          Qy
                                                                                                                                                                                                                         В
                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-771-382-38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn version 3.0 SEQ ID NO 38 LENGTH: 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 38, Application U Patent No. US20020160016A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ. ID NOS: 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-24U1
                                                               121 NGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG 180
181 WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS 240
                                                                                                                                                                                                                                                                                                                   382;
                                                                                                                                    61
                                                                                                                                                         61 TEVKIGAKTSVIKEKDGKLYTGKDKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTA 120
                                                                                                                                                                                                                            _
                                                                                                                                                                                                                                                 1 NRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK 60
                                                                                                                                    TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTA 120
                                                                                                                                                                                                                         NRAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK 60
                                          NGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Application US/09771382
                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                 100.0%; Score 1947; DB 10; 100.0%; Pred. No. 1.1e-149; Live 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                              Length 382;
                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                 Gaps
```

```
APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
FILE REFERENCE: 8795-2401
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US/01/77,917
PRIOR FILING DATE: 2000-01-25
PRIOR FILING DATE: 2000-01-25
UNMBER OF SEQ ID NOS: 52
SOFTWARE: Patentin version 3.0
SEQ ID NO 26
RESULT 3
US-09-771-382-35
; Sequence 35, Application US/09771382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; LENGTH: 433
; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-771-382-26
                                                                                     δÃ
                                                                                                                  밁
                                                                                                                                        γQ
                                                                                                                                                                  Ъ
                                                                                                                                                                                      Q
                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 2
US-09-71-382-26
: Sequence 26, Application US/09771382
: Patent No. US20020160016A1
: GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                 412
                                                                                                                   352
                                                                                                                                            301
                                                                                                                                                                    292
                                                                                                                                                                                           241
                                                                                                                                                                                                                     232
                                                                                                                                                                                                                                                                     172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                       52
                                                                                                                                                                                                                                                                                                                                                                   KGTASGNSRGHFGASASVGYQW 382
                                                                                                                              IDNVDGNARAGIAQAIATAGLYQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                              VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                  WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                                                                                                                                                                                                 VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KGTASGNSRGHFGASASVGYQW 382
                                                                 KGTASGNSRGHFGASASVGYQW 433
                                                                                                                                                                  VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGTASGNSRGHFGASASVGYQW 382
                                                                                                                 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                      100.0%; Score 1947; DB 10; ilarity 100.0%; Pred. No. 1.3e-149; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                           . 120
                                                                                                                                                                                                                                                                                                                                                                      111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        360
                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                    171
                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                  351
                                                                                                                                                                                                                    291
                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Patent No. US20020160016A1
; GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-74U1
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
                                                                                                                                                                                                                             US-09-771-382-23; Sequence 23, Application U; Patent No. US20020160016A1
                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Neisseria meningitidis US-09-771-382-35
                                                                                                                                                                                                                    ; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 381
                                                                            SEQ ID NO 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn version 3.0 SEQ ID NO 35
                                                                                                                                      APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-2401
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
                                                                                       NUMBER OF SEQ ID NOS: 52
SOFTWARE: PatentIn version
                                                                                                               PRIOR APPLICATION NUMBER: US 60/177,917 PRIOR FILING DATE: 2000-01-25
                                       ORGANISM:
                                                    TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: PRT
                                                              LENGTH: 512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH: 461
                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                          321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       441
                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                        381
                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           381;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                      NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                          NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99.7%; Score 1941; DB 10; ilarity 100.0%; Pred. No. 4.3e-149; Conservative 0; Mismatches 0;
                                        meningitidis
   99.78;
                                                                                                                                                                                                                                          US/09771382
                                                                                         3.0
   Score
   1941;
   ₽B
   10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
   512;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  461;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
```

140

61

121 200 181

```
δÃ
                                                                                                                   밁
                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 5
US-09-771-382-33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                              Š
                                                         Дd
                                                                                                                                                                     밁
                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                           ; ORGANISM: Neisseria
US-09-771-382-33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                       Query Match
Best Local S
Matches 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 33, Application U Patent No. US20020160016A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Loc
Matches
                                                                                                                                                                                                                                                                                                                              SEQ ID
                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-2401
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn
                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
                                                                                                                                                                                                                                                                                                  EQ ID NO 33
LENGTH: 540
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         132
                340
                                                                                                                    220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                 280
                                                                                                                                                                     160
                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                               N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N
                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                 RAASVKDYLNAGWNIKGYKPGTTASDNYDFYRTYDTYEFLSADTKTTTYNYESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVKIGAKTSVIKEKDGKLYTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                          NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
              NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                       version 3.0
                                                                                                                                                                                                                                                                                      meningitidis
                                                                                                                                                                                                                    99.7%; Score 1941; DB 10; 100.0%; Pred. No. 5.4e-149; tive 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/09771382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . 5e-149;
0;
                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                               540;
                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                     Gaps
                                                                                                                                                                    219
                                      241
                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       191
RESULT 7
US-09-797-862-21; Sequence 21, A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; LENGTH: 591
; TYPE: PRT
; ORGANISM: Neisseria
US-09-797-862-11
                                                                                                                 밁
                                                                                                                                     Qγ
                                                                                                                                                                   В
                                                                                                                                                                                         Qy
                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-797-862-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2
SEQ ID NO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 11, Application U Patent No. US20020102276A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 381; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/09/797,862
CURRENT FILING DATE: 2001-05-03
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: PEAK, IAN RICHARD ANSELM APPLICANT: JENNINGS, MICHAEL PAUL APPLICANT: MOXON, E. RICHARD TITLE OF INVENTION: NOVEL SURFACE AFILE REFERENCE: 065064/0134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           460
                                                                 571
                                                                                        362
                                                                                                                 511
                                                                                                                                           302
                                                                                                                                                                    451
                                                                                                                                                                                                                     391
                                                                                                                                                                                                                                                                        331
                                                                                                                                                                                                                                                                                                                           271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                             211 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTASGNSRGHFGASASVGYQW
                                                                                                              SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                   NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                    GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                           EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                       EVKIGAKTSVIKEKDGKLYTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                          RAASVKDVLNAGWNIKGVKPGTTASDNVDEVRTYDTVEEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                        GTASGNSRGHFGASASVGYQW
                                                                                                                                                                     SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                        GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                     NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 Application US/09797862
                                                                                                                                                                                                                                                                                                                                                                                                                           99.7%; Score 1941; DB 10; ilarity 100.0%; Pred. No. 6.1e-149; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/09797862
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SURFACE ANTIGEN
                                                                 591
                                                                                        382
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                   570
                                                                                                                                           361
                                                                                                                                                                     510
                                                                                                                                                                                                                     450
                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                        390
                                                                                                                                                                                                                                                                                                                           330
                                                                                                                                                                                                                                                                                                                                                                              270
```

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                        US-09-771-382-1
                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; ORGANISM: Neisseria meningitidis US-09-797-862-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0134
CURRENT APPLICATION NUMBER: US/09/797,862
CURRENT FILING DATE: 2001-05-03
PRIOR APPLICATION NUMBER: DCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                        GENERAL INFORMATION:
APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED
FILE REFERENCE: 8795-24U1
                             SOFTWARE: PatentIn version 3.0 SEQ ID NO 1 LENGTH: 591
                                                                                                                                                                                                                                      Sequence 1, Application US/09771382 Patent No. US20020160016A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Patent No. US20020102276A1
GENERAL INFORMATION:
APPLICANT: PEAK, IAN RICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQ ID NO 21
                                                                       CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQ ID NOS: 33
ORGANISM: Neisseria
                                                                                                                                                                                                                                                                                                                                      571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               391
                                                                                                                                                                                                                                                                                                                                                                   362
                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  381;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PatentIn Ver. 2.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                             EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                    GTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                  GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQTGQADKFETVT$GTNVTFASGKGTTATV$KDDQGNITVMYDVNVGDALNVNQLQN$GW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IAN RICHARD ANSELM
 meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99.7%; Score 1941; DB 10; 100.0%; Pred. No. 6.1e-149; tive 0; Mismatches 0;
                                                                                                                                                                          SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 591;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     270
```

```
Дb
                                                                                                        Qy
                                                   Ş
                                                                                                                                                            δÃ
                                                                                                                                                                                                                                               US-09-771-382-5
                                                                                                                                                                                                                                                         ; SOFTWARE: PatentIn ver
; SEQ ID NO 5
; LENGTH: 591
; TYPE: PRT
; ORGANISM: Neisseria n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-771-382-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-771-382-1
                                                                                                                                                                                         Query Match
Best Local S
Matches 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 5, Application US/09771382 Patent No. US20020160016A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 381;
                                                                                                                                                                                                                                                                                                                                                                     FILE REFERENCE: 8795-24U1
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
 182
                           331
                                                    122
                                                                               271
                                                                                                                                    211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122 GOTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  211 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                          381;
                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62 EVKIGAKTSVIKEKDGKLYTGKDKGENGSSTDEGEGLYTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                               2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                              DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                    RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTASGNSRGHFGASASVGYQW 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                           GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                  version
                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99.7%;
                                                                                                                                                                                                    99.7%; Score 1941; DB 10; 100.0%; Pred. No. 6.1e-149;
                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1941; DB 10;
Pred. No. 6.1e-149;
                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                           390
                                                    181
                                                                               330
                                                                                                         121
                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            510
 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                    270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0
```

Qy DЬ δÃ

망

ρ

рь

₽

```
US-09-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; TYPE: PRT ; ORGANISM: Neisseria meningitidis US-09-797-862-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 2, Application US/09797862
Patent No. US20020102276A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO 2
LENGTH: 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: PEAK, IAN RICHARD ANSELM
APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -09-797-862-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/797,862
CURRENT FILING DATE: 2001-05-03
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         511
                                                                                                                                                                                                                                                                                                                                      332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 451
                                                                      362
                                                                                                                                                                                    452
                                                                                                                                                                                                                       242
                                                                                                                                                                                                                                                            392
                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                              272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              380;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTASGNSRGHFGASASVGYQW 382
                                                                                                                            DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
                                                                                                                                                                                  SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                      SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
                                                                                                                                                                                                                                                            NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                                                              NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
                                                                                                                                                                                                                                                                                                                                      GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                          GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
                                                                                                                                                                                                                                                                                                                                                                                                              EVKIGVKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 1937; DB 10;
Pred. No. 1.3e-148;
0; Mismatches 1;
                                    592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           450
                                                                                                         571
                                                                                                                                                                                                                                                            451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; SEQ ID NO 27
; LENGTH: 502
; TYPE: PRT
; ORCANISM: Neisseria m
US-09-771-382-27
                                                                                                                                                                                                                                                                                                                   RESULT 12
US-09-797-862-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 11
US-09-771-382-27
                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 27, Application US/09771382 Patent No. US20020160016A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 374; Conserv
                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                              Sequence 9, Application US/09797862 Patent No. US20020102276A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICAMT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SUFFACE ANTIGEN
FILE REFERENCE: 8795-24U1
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
SOFTWARE:
SEQ ID NO 9
                               CURRENT APPLICATION NUMBER: US/09/797,862
CURRENT FILING DATE: 2001-05-03
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
                                                                                                                                                             APPLICANT: PEAK, IAN RICHARD ANSELM
APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Peak, APPLICANT: Jenn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: PatentIn version 3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                              KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSG
                                                                                                                                                                                                                                                                                                                                                                                             KGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97.18;
                     2.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1891.5; DB Pred. No. 5e-145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
```

DB 10; 0,

Length

7;

Gaps

60

240 120 180

Q

480

360 420 300 360 240 300 180

Š 밁 Q 밁 Qy В Qy 밁 QY 밁

δ Ъ

밁

452 241

572 360

```
GENERAL INFORMATION:
APPLICANT: Peak, Ian
APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-2401
CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; LENGTH: 594
; TYPE: PRT
; ORGANISM: Ne
US-09-797-862-9
                                                                                                          B
                 δõ
                                               밁
                                                                            Qy
                                                                                                                                       Ω
                                                                                                                                                                                                                                    ; LENGTH: 594
; TYPE: PRT
; ORGANISM: Neisseria
US-09-771-382-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 13
US~09-771-382-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            日
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                                                                                                               SOFTWARE: PatentIn version 3.0 SEQ ID NO 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 4, Application US/09771382
                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patent No. US20020160016A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     373;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N
                                                                                                        RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT 61
                                            EVKIGAKTSVIKEKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTAN
              GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                             EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KGTASGNSRGHFGASASVGYQW 594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                 meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                meningitidis
                                                                                                                                                                                     96.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96.98;
97.68;
                                                                                                                                                                        Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω
••
                                                                                                                                                                      Score 1886.5; DB 10
Pred. No. 1.6e-144;
3; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 1886.5; DB 1
Pred. No. 1.6e-144;
3; Mismatches 5;
                                                                                                                                                                                                     DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 10;
                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                     594;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  594;
                                                                                                                                                                     1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1;
                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         452
                 181
                                                                                                          272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    392
                                                                       δÃ
                                                                                                          맑
                                                                                                                                   QУ
                                                                                                                                                                      DЪ
                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-797-862-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 14
US-09-797-862-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                   Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOFTWARE: POSEQ ID NO 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 15, Application UP Patent No. US20020102276A1
                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT FILING DATE: 2001-05-03
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: PEAK, IAN RICHARD ANSELM
APPLICANT: JENNINGS, MICHAEL PAUL
APPLICANT: MOXON, E. RICHARD
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0134
CURRENT PELICATION NUMBER: US/09/797,862
CURRENT FILING DATE: 2001-05-03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQ ID NOS: 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                          458
                                              518
                                                                                                                                                                      398
                                                                                                                                                                                                                                   338
                                                                                                                                                                                                                                                               122
               361
                                                                          301
                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                            278
                                                                                                                                                                                                                                                                                                                                                        218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           333
                                                                                                                                                                                                                                                                                                                          62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          599
                                                                                                                                                                                                                                                                                                                                                                                   2
                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PatentIn Ver. 2.1
                                                                                                                                                                                   NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                               GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
               KGTASGNSRGHFGASASVGYQW
                                                          IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
                                                                                                                       SIGAGADAPTLSVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
                                                                                                                                                                                                                                                                                                          EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLGAGADAPTLSVDDKGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                   NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
                                                                                                                                                                                                                                GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGW
                                                                                                                                                                                                                                                                                            EVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                        RAASVKDVLNAGWNIKGVKPGTTASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRT
                                                                                                                                                                                                                                                                                                                                                                       RAASVKDYLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KGTASGNSRGHFGASASVGYQW 382
                                            IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KGTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
Application US/09797862
                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                              96.6%;
97.6%;
                                                                                                                                                                                                                                                                                                                                                                                                             Score 1881.5; DB 10
Pred. No. 4.1e-144;
Pred. No. 4.1e-144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                594
                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
```

599; 1;

Gaps

241

181

337

277

397

457

В

578 KGTASGNSRGHFGASASVGYQW 599

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; TYPE: PRT; ORGANISM: Neisseria meningitidis US-09-771-382-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 15
US-09-771-382-6
; Sequence 6, Application US/09771382
; Patent No. US20020160016A1
Search completed: October 6, Job time: 20.136 secs
                                                                                                                                                               밁
                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CURRENT APPLICATION NUMBER: US/09/771,382
CURRENT FILING DATE: 2001-01-25
PRIOR APPLICATION NUMBER: US 60/177,917
PRIOR FILING DATE: 2000-01-25
NUMBER OF SEQ ID NOS: 52
SOFTWARE: Patentin version 3.0
SEQ ID NO 6
LENGTH: 599
THE SECOND SECON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: Peak, Ian
APPLICANT: Jennings, Michael
TITLE OF INVENTION: MODIFIED SURFACE ANTIGEN
FILE REFERENCE: 8795-2401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 96.6%; Score 1881.5; DB 10; Length 599; Best Local Similarity 97.6%; Pred. No. 4.1e-144; Matches 373; Conservative 1; Mismatches 7; Indels 1;
                                                                                                                                                   182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQESSV 241.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        278 EVKIGAKTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
                                    2003, 10:19:51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 277
```

THIS PAGE BLANK (USPTO)

us-09-771-382-38.rpr

Mon Oct

```
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

Run on:

October 6, 2003, 09:13:35 ; Search time 10.9348 Seconds (without alignments) 3359.577 Million cell updates/sec

Title: Perfect score:

US-09-771-382-38 1947 1 NRAASVKDVLNAGWNIKGVK......TASGNSRGHFGASASVGYQW 382 Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

283308 seqs, 96168682 residues Searched:

283308 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database

PIR_76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	adhesin NMB0992 [1	probable surface f	surface protein XF	surface protein XF	probable adhesin Z	probable adhesin E	probable autotrans	probable surface p	adhesin homolog HI	cell surface prote	surface-exposed on	flagellin [importe	υ	띮	adhesin/invasin, p	n	probable adhesin h	high-molecular-wei	fibrinogen-binding	hypothetical prote	fibrinogen-binding	glycoprotein Vp260	190K surface antiq	probable exported	flagellin - Escher	hypothetical prote		hypothetical prote	\Box
																				1										
IES																														
SUMMARIES	ID	G81133	A81888	D82671	A82615	A86036	H91188	AC0976	AH0110	I64138	AB3486	C82672	F90961	F85809	C48658	A81019	A43855	AF0394	B43855	S41539	T31105	D89852	T17508	A41477	AE0169	A48658	G64964	AI0452	E97835	39
	DB	7	~	~	~	~	~	7	~	7	7	~	~	~	7	7	~	~	~	7	~	7	~	7	~	7	~	~	~	7
	Length	591	592	2059	1190	1588	1588	1107	658	298	365	1004	585	582	584	364	1536	1910	1477	933	4919	686	1335	2249	364	595	1091	1635	1655	2020
de	Ouery	99.7	95.2	17.3		16.7		16.3	16.0		9.5	9.1	9.0	9.0	8.4	8.4	8.2		8.1	8.0	8.0	•	٠	٠	•	7.8	٠	•	7.8	7.8
	Score	1941	1854.5	336.5	335	325.5	325.5	318	312	247	185	176.5	175	175	163.5	163	159	159	158.5	156.5	156	155.5		154.5	154	ഗ	•	52.	22	10
	Result No.	п	7	æ	4	2	9	7	ω	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

В δy qq δý

362 GTASGNSRGHFGASASVGYQW 382

hemagglutinin/hemo probable flagellin	probable structura hypothetical prote outer membrane pro	probable RTX famil hypothetical prote	ilagellin - Escher hypothetical prote	outer membrane pro adhesin/invasin-li	adhesin/invasin-li sapB protein - Cam	S-layer protein - hypothetical prote	probable BigA-like
T09083 H90681	D85532 E90696 S07575	B85547 F90696	B48658 B98047	JC1340 D90697	G85547 I40711	T03415 C85739	F90879
77	000	00	~ ~ .	200	7 7	7	7
2273	980 1461 1300	5188 5291	2551	338	338 936	1361	1011
7.8	7.7	7.7	9.7.	9.7.	7.6	7.6	7.5
152	151 150.5 150	150	148.5	147.5	147.5	147	146.5
30	332 343	3 3 2	38	£ 4.	4 4 2 2	443	4.5

ALIGNMENTS

RESULT G811313 G811313 C7 Spec C7 Spec C7 Acce R7 Acce A7 Acce A7 Acce A7 Stat A7 Stat A7 Stat A7 Stat C7 C6 A7 C7	RESULT 1 GB1133 adhesin NMB0992 [imported] - Neisseria meningitidis (strain MC58 serogroup B) C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001 C;Accession: GB1133 R;Tettellin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. Science 287, 1809-1815, 2000 A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A;Reterence number: A81000; MUID:20175755; PMID:10710307 A;Status: preliminary A;Residues: 1-591 «TET-> A;Cross-references: GB:AE002450; GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722 A;Cross-references: GB:AE002450; BS:AE1000 B, strain MC58
A) de	A; wene: NWB0932
Qu	Query Match
Be	Best Local Similarity 100.0%; Pred. No. 3.7e-103;
Ma	Matches 381; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
QQ	2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT 61
oy	62 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
Db	
qq	122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
Ao	
QQ	182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
Dp	
Qy	242 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
Db	

```
R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as-Necoto, E.; Docena, C.; El Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr
J.D.; Junquelira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kurame, E.E.; La
chdo, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins
A;Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.
F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri,
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr. V. E.; de Sa, R.G.; Santelli, R.V.; Sawa
A;Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, E.R.; da Silva, F.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, E.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, E.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.M.; Silva Silva, A.M.; Silva Silva, A.M.; Silva Silva, A.M.; Silva Silva, A.D.; de Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nucleotide Seg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1761 GSGAAASGKGSTAIGRNAIASADGSVALGDGAKDGGRGAESYTGKYSGVQNNTVGTVSVG 1820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -----KAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTP 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Surface protein XF1981 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Species: Xylella fastidiosa
C;Bate: 18-May-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C;Accession: A82615
R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucle Nature 406, 151-157, 2000
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; MUID:20365717; PMID:10910347
A;Note: for a complete list of authors see reference number A59328 below
A;Status: preliminary
A;Status: preliminary
A;Nolecule type: DNA
A;Residues: 1-1190 <SIM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1583 SVSEAVDKGWTLTASGANGSKVVSGGTVDLKNTDGNLAISKSGDSNDVVFNLSKDFKVDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5. SVKDVLNAGWNI-----KGVKPGTTASDNVD-----FVRTYDTVEFLSADTK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----TTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGEN-----GSSTDEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EGLVTAKEVIDAVNKAGWRMKTTT------ANGQTGQ---ADKFETVTSGTNV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1701 VNVSQLKQAVQSVTVKATRYYSTNDGGTQGGNYDGDGATGSKAIAAGVGTQASGEGAAAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237 QFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            297 LNNRIDNVDGNAR----AGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 2059;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---KDDQGNITVMYDVNVG-DALNVNQL----QNSGWNLDS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ---TFASGKGTTA------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 336.5; DB 2;
Pred. No. 2.7e-11;
63; Mismatches 154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353 SDGGNWIIKGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17.3%;
25.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 128; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: XF1529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Db
                                                                                                                                                                                                       C; Species: Neisseria meningitidis
C; Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C; Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C; Accession: AB188
C; Mulb: 05. Mulb: 05. Mulb: 05. Mungall, K.; Quail, M.A.; Rajandream, A; Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis 22491.
C; Accession: AB1888
C; Mulb: 05. Mulb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Residues: I-2059 <SIM>
A;Cross-references: GB:AE003982; GB:AE003849; NID:g9106554; PIDN:AAF84338.1; GSPDB:GN001
A;Experimental source: strain 9a5c
                                                                                                                                                                                     2249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Seguer
                                                                                                                                                                              probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Surface protein XF1529 [imported] - Xylella fastidiosa (strain 9a5c)
C;Species: Xylella fastidiosa
C;Dacts: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
C;Accession: D82671
R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide (Nature 406, 151-157, 200
A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.
A;Reference number: A82515; Muld: 20365717; PMID: 10910347
A;Note: for a complete list of authors see reference number A59328 below
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNS 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SVSLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVSLGAGADAPTLSVDDEGALNVGSKDANKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2 RAASVKDVLNAGWNIKGVKPGTTA--SDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 592;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1854.5; DB 2; Length
Pred. No. 3.1e-98;
6; Mismatches 7; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IIKGTASGNSRGHFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTASGNSRGHFGASASVGYQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95.2%;
95.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cal Similarity 95.8 368; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Note: for a complete
A;Accession: D82671
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 299
          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
```

```
A; Gene: Z5029
                                                                                    Query Match
Best Local
     C; Genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 6
                                                                                                                                                                                                                                          Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Dp
                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                              δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probable adhesin 25029 [imported] - Escherichia coli (strain 0157:H7, substrain EDL933) C; Species: Escherichia coli coli coli coli coli della coli della coli della coli della coli di seguence_revision 16-Feb-2001 #text_change 14-Sep-2001 C; Accession: A86036 C; Accession: A86036 C; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhew Iller, L.; Grotheck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apodaca, Nature 409, 529-533, 2001 A; Feference onumber: A85480; MUD:21074935; PMID:11206551 A; Reference onumber: A86036 A; Status: preliminary A; Molecule type: DNA A; Molecule type: DNA A; Molecule type: DNA A; Residues: 1-1588 cSTO> A; Cross-references: GB-AE005174; NID:912518349; PIDN:AAGS8749.1; GSPDB:GN00145; UMGP:256 A; Experimental source: strain 0157:H7, substrain EDL933
              A: Experimental source: strain 9a5c
R: Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; P. Stubeson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Carraro, D.M.; Ferro, J.A.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Kranca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.M.B.; Madeira, H.M.F.; Marxino, C.L.; Marques, M.Y.; Martins, E.B.; Laign Chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marxino, C.L.; Marques, D.C.; Marxino, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.P. Rodriques, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Say, R.G.; Santelli, R.V.; Sawasak A.Authors: da Silva, A.C.R.; da Silva, R.M.; Silva Jr., W.A.; da Silva, M.A.; Areference number: A59328
A.Reference number: A59328
A.Contents: annotation
C:Genetics:
A;Cross-references: GB:AE004017; GB:AE003849; NID:99107083; PIDN:AAF84783.1; GSPDB:GN001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      171 LNVNQL----QNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGK 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     52 VESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENG-SSTDEGEGLVTAKEVIDAVNK 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   111 AGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDA 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      922 -GAKDGARGAESYTGKYSGLQNNTVGTVSVGDASKGETRTVS----NVADAKEAT--DA 973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGNSRGH 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 866 GDGATGTRSIAVGVGTLASA----EGATAVGSGAAASGKGSTAIGRNAVASADGSVALGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           227 NIDIATSMTPQFSSVSLGAGADAPTLSV----DGDALNVGSK----KDNKPV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             271 ------RITHVAPGVKEGDVTHVAQLKGVAQNLHNRIDHVDGHAR----AG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1060 DRANTVSVGSAGSERQVTNVAAGTADTDAVNVSQLNQGLITAKQYTDGVVGSLRRDTDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10 LNAG-WNIKGVKPGTTASD-------NVDEVRTYDTVEFLSADTKTTTVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 17.2%; Score 335; DB 2; Length 1190; Best Local Similarity 26.9%; Pred. No. 1.7e-11; Matches 116; Conservative 54; Mismatches 151; Indels 110; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | | |||||
1180 VGIGAGVGYQW 1190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 372 FGASASVGYOW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ά
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
```

```
œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ပ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probable adhesin ECs4480 [similarity] - Escherichia coli (strain O157:H7, substrain DCSSpecies: Escherichia coli (C; Species: Escherichia coli (C; Species: Bscherichia Coli (C; Species: Br. 191188) (S; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han, C; Hayashi, T.; Makino, K.; Ohnishi, M.; Shiba, T.; Hattori, M.; Shinagawa, H. DNA Res. 8, 11-22, 2001
A; Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 and A; Reference number: A99629; MUID:21156231; PMID:11258796
A; Status: preliminary
                                                                                                                                                                                                                                                                                               1326 TNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIAAA 1385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1221 IGIGYGAYVDANALNGIAIGSNAQVIHV--NSIAIG-----NGSTTTRGAQTNYTAYNMD 1273
                                                                 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              160 TVM------YDVNVGDAL------NVNQLQNSGWNLDSKAVAGSSGKVI 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A,Residues: 1-1588 <hAx>
A;Cross-references: GB:BA000007; PIDN:BAB37903.1; PID:g13363955; GSPDB:GN00154
A;Experimental source: strain 0157:H7, substrain RIMD 0509952
C;Genetics: A;Gene: EC84480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   107 AVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNI 159
                                                                                                                             09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           09
                                                                                                                                                                                                                                                                                                                                                                                                                                         1274 APQNSVGEFSVGSADGQRQITNVAAGSAD-----TDAVNV--GQLKVTDAQVSQNTQ-SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1169 AVTVRQLQNA-----IGAVATTPTKYFHANSTEEDSLAVGTDSLAMGAKTIVNGDKG
                                                                                                                                                                                                                                                              -----TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVID
                                                                                                                                                                                                                                                                                                                                                                                    107 AVNKAGWRMKTTTANGQ-----TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            197 SGNVSPSKGKM---DETVNINAGNNIEITRN---GKN----IDIATSMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1386 DNSVALGTGSVATEENTISVGSSTNQRRITINVAAGKNATDAVNVAQLKSSEAGGVRYDTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                296 NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------TEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVID
                                                                                                                                3 AASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVE·FLSADTKTTTVNVESKDNGKK·
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      247 ADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQ------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3 AASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVE-FLSADTKTTTVNVESKDNGKK-
                                                                 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1588;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 16.7%; Score 325.5; DB 2; Best Local Similarity 26.2%; Pred. No. 8.5e-11; Matches 117; Conservative 61; Mismatches 175;
                                                              61; Mismatches 175;
   Score 325.5; DB 2
Pred. No. 8.5e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GNWIIKGTASGNSRGHFGASASVGYQW 382
16.78;
26.28;
                                                                     Matches 117; Conservative
                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
```

:	125	οy	299 NRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNW 358
OY 160 TVMYDVNVGDALNVNOLONSGWNLDSKAVAGSSGKVI 196	91	qq	1024 SKIKGIENKMSGGIASAMAMAGLPQAYAPGANMTSIAGGTFNGESAVAIGVSMVSESGGW 1083
Db 1326 TNLDNRVTNLDSRVTNIENGIGDIVTTGSTKYFKTNTDGVDASAQGKDSVAIGSGSIAAA 1385	185	Qy	359 IIKGTASGNSRGHFGASASVGYQW 382
QY 197 SGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAG 246 : : :	66	qq	1084 VYKLQGTSNSQGDYSAAIGAGFQW 1107
247 ADAPTLSVDGDALNVGSKKDNKPVRITNVARGVKEGDVTNVAQLKGVAQ2	14.5 15	RESULT 8 AH0110	
DD 1446 ADGSIDYSNITLGG-GNGGTTRISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRAV 1501	103	probable C;Specie	probable surface protein (partial) YP00902 [imported] - Yersinia pestis (strain CO92) (Species Yersinia pestis (Strain CO92) (Species Yersinia pestis CO92) (Species Yersinia pestis CO92)
Qy 296 NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDG 355 ::1::	55	C, Daces C; Access R; Parkhi deno-Tar	or now 2001 *Sequence_revision of now 2001 *real_change of now 2001 11, J.; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M Trada, A.M.; Chillinoworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Doudan, G
		il, M.; Nature 4 A;Title:	il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrel Mature 413, 523-577, 2001 Nature 413, 523-527, 2001 A;Title: Genome sequence of Yersinia pestis, the causative agent of plague.
Db 1562 GRWVYKLQGSTNSQGEYSAALGAGIQW 1588		A; Refere A; Access	
RESULT 7		A; Status A; Molecu	A;Status: preliminary A;Molecule type: DNA A:Docidance: 1-650 2000
probable autotransporter sapB [imported] - Salmonella enterica subsp. enterica C. Species. Calmonella enterica enterica	sa serovar T	A; Cross-	#; Restudes: 1.050 \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\
A; Note: this species has also been called Salmonella typhi C; Date: 09-Nov-2001 #sequence revision 09-Nov-2001 #text change 18-Nov-2002		A; Gene: YPO0902	YP00902
C;Accession: AC0976 R;Parkhill, J.; Dougan, G.; James, K.D.: Thomson, N.R.; Pickard, D.: Wain, J.;	Churcher	Query Match	Query Match 16.0%; Score 312; DB 2; Length 658; Best Local Similarity 26.2%; Pred. No. 1.7e-10;
th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N. S.; Monie, S. O'Garra, D.	N.; Farrar,	Matches	vative 58
Nature 413, 848-852, 2001 A: Authors Parry, C.; Quall, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens A: Atthory Communication of a control of the c	ens	oy 1	5 SVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNCKKT 61
A; Reference number: AB0502; MUID:21534947; PMID:11677608	erica serov	3	CONTRACTOR ACTION OF THE CONTRACTOR
A;Accession: AC0976 A;Status: preliminary A;Molecule type: DNA		Qy Db	62EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTT 118
A; Residues: 1-1107 <par> A; Cross-references: GB: AL513382; PIDN: CAD03303.1; PID: 916504923; GSPDB: GN00176 C; Genetics:</par>	9,	Qy	119 TANGGIGQADKFETVISGINVTFASGKGTTATVSKDDGGNITVMYDVNVGDALNVNQLON 178
A; Gene: sapB		Dp	NVADGLQA
Query Match 16.3%; Score 318; DB 2; Length 1107; Best Local Similarity 25.9%; Pred. No. 1.5e-10; Matches 115; Conservative 60; Mismatches 180; Indels 89; Gaps 15;	15;	Qy	179 SGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDIATSMT 235 :
QY 16 IKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVK 64	35	Qy	236 PQFSSVSLGAGADAPTLSVDGDALNVGSKRDNKPVRITNVAPGVKEGDVT 285
Qy 65IGAKTSVIKEKDGKLVTGKDKGENGSSTDEG-EGLVTAKEVIDAV 108		Qy	286 NVAQLKGVAQNLINNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAI 334
TATAL TO THE TATAL THE TATAL TO THE TATAL TH) r	3 6	
QY 109 NAAGWRMKTTTANGGTGGADKFETVTSGTNVTFASGKGTTATVSKDDQGNITV 161 f	17	δy	335 GGGTYKGEAGYAIGYSSISDGGNWIIKGTASGNSKGHFGASAAVGYQW 382 : :: :: : :
Qy 162 MYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVS 201 : : : : : : Db 848 NTQVSNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGADSVAIGSGSIAAAENS 907	01	RESULT 9 164138	,
Qy 202 PSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADA 249 : :	6	adhesin C;Specie C;Date:	adhesin homolog H1732 - Haemophilus influenzae (strain Rd KW20) C:Species: Haemophilus influenzae C:State: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
250	86	R; Fleisc ; Gocayr , D.M.;	R.F. Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weldman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M.
Db 968SVNYSVLNLGDGSGG-TTRIGNVSAAVNDTDAVNYAQLKRSVEEANTYTDQKMGEMN 1023)23	Science	269, 496-512, 1995

12:39:11 2003

o

Mon Oct

Seq

(strain

```
A:Experimental source: strain 9a5c
R:Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.
Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer
as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A:Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.B.; Kuramae, E.E.; La
chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins,
R.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri,
Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa
A.Authors: da Silva, A.C.R.; da Silva, F.W.; da Silva, A.M.; Silva Jr., W.A.; de Silva
A.Reference number: A59328
A:Contents: annotation
C:Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-1004 <SIM>
A; Cross-references: GB:AE003981; GB:AE003849; NID:g9106543; PIDN:AAF84325.1; GSPDB:GN
                                                                                                                             Surface-exposed outer membrane protein XF1516 [imported] - Xylella fastidiosa (stre C; Species: Xylella fastidiosa C; Species: Xylella fastidiosa C; Species: Xylella fastidiosa C; Species: Xylella fastidiosa Consortium of the Crganization for Nucleotide 5 R; anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide 5 Nature 406, 151-157, 2000 A; The Species Consortium of the Organization for Nucleotide 5 A; Title: The genome sequence of the plant pathogen Xylella fastidiosa. A; Reference number: A82515; MUID:20365717; PMID:10910347 A; Note: for a complete list of authors see reference number A59328 below A; A; Accession: C82672 A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             flagellin [imported] - Escherichia coli (strain 0157:H7, substrain RIMD 0509952)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     263 SKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNV------DGNARAGIA 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               155 DOGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNIN 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              314 QAIATAGLVQAYLPGKSMMAIG-----GGTYRGEAGYAIGYSSISDGGNWIIKGTA- 364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                468
        AAIGLAAASLRYDDRPGKISAAIGGGFWRGEGAVALGLGHTSEDQRMRSNLSAATSGGNW 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----DAVNKAGWRMKTTTANGQTGQADKFETV----TSGTNVTFASGKGTTATVS-KD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         195 GIGNNDAVNKSQLDGVTASVN---DVAASVKTIALTNQVTGSSVASASGKESTAIGSGAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    252 AVADNTVAF----GGRAIANAVGASALGFDSHAKGINSTTVGTQSVSLGQGGVSLGYNSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         215 AG----NNIEITRNG----KNIDIATSMTPQFSSVSLGAGADAPTLSV----DGDALNVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            53 ESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE-NGSSTDEGEGLV--TAKEVI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9.1%; Score 176.5; DB 2; 25.8%; Pred. No. 0.014; Itive 58; Mismatches 141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --SGNSRGH---FGASASVG 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEGGTSLGYNSFVGOSATNG 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 98; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Gene: XF1516
        295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 12
        음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AB3486

Cell surface protein [imported] - Brucella melitensis (strain 16M)

C;Species: Brucella melitensis
C;Species: Brucella melitensis
C;Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002
C;Accession: AB3486

R;Delvecchio, V. G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanova, Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Letess Proc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular pathogen Brucella melitens A;Reference number: AB3486
A; Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Venter, A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800 A;Accession: I64138
                                                                                                                                A;Molecule type: DNA
A;Residues: 1-298 <TIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:91574588; PID:91574589; TIGR:HI1732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Residues: 1.365 KKUR>
A; Cross-references: GB:AE008917; PIDN:AAL53053.1; PID:g17983913; GSPDB:GN00190
A; Experimental source: strain 16M
C; Genetics: A; Gene: BME11872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             115 MKTTTANGQ----TGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDA 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     171 VNGSQL----VTENDK---- 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----FSVKYDRHSDGTKKNSMTLQGWDSATPVVLANVADGVHK 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ||-||| ||-: |
NDAVNVSQLKAGLSTTLGEAKAYTDQTALQTLDQANAYTDKKFGKLNEDIVATRIEARQA 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          231 ATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDN------KPVRITNVAPGVKE 281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --YSSISDGGNW 358
                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SISVGNGAQASA----HGSVAL----GENAAAPDANSVALGAGSKTSEVV-----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4 ASVKDVLN---AGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGK-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60 KTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDE----GEGLVTAKEVIDAVŅKAGWR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   171 LNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        113; Indels 162;
                                                                                                          A; Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                Length 298;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 365;
                                                                                                                                                                                                                                                                                                  29; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ||| |||||||: :|||:|||
EVKFTPKTSVIKDNNGKLLTGKQLKDANTGTATNATE 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                               EVKIGAKTSVIKEKDGKLVTGKD--KGENGSSTDEGE 96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDVTNVAQLK-GVAQNLNNRIDNVDGNARAGIAQA----
                                                                                                                                                                                                                                             Score 247; DB 2;
Pred. No. 3.2e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 185; DB 2;
Pred. No. 0.0014;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               317 ATAGLVQAYL-----PGKSMMAIGGGTYRGEAGYAIG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     43; Mismatches
                                                                                                                                                                                                                                                                                               15; Mismatches
                                                                                                                                                                                                                                          12.7%;
52.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.5%;
                                                                                                                                                                                                                                                                                               51; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 102; Conserva
                                                                                                                                                                                                                                                                      Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Map position: I
                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    282
                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
```

262

307

```
FESULT 14
C48658
flagellin - Escherichia coli (strain U5-41)
C;Species: Escherichia coli
C;Date: 03-May-1994 #sequence_revision 03-May-1994 #text_change 26-Aug-1999
C;Accession: C48658
B;Schoenhals, G; Whitfield, C;
J; Bacteriol. 175, 5395-5402, 1993
A;Tille: Comparative analysis of flagellin sequences from Escherichia coli strains po
A;Reference number: A48658; MUID:93374833; PMID:8366026
A;Accession: C48658
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-884 -scher
A;Residues: 1-884 -scher
A;Residues: 1-884 -scher
A;Residues: 1-884 -scher
C;Superfamily: flagellin
                                     17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         215 TIDAAFDKLGNGDKVIVGGVD-----IYNAKSGDFTITK--STAGTGVDAAAQAIDSAK 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    267 KRDALAATLHADVGKSVNGSYTTKDGTV-SFVTDSAGN---ITIGGSQAYVDDAGNLTTN 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             238 FSSVSLGA------GADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTN 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             77 GKLVTGKDKGENGSSTDEGEGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQAD-KFETVT 134
                                                                                                                                                                                                                                                                                                                                                                                                                                       267 SKRDALAATLHADVGKSVNGSYTTKDGTV--SFETDSAGNITIGGSQAYVDDAGNLTTNN 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 325 AGSAAKADMKALXKAASEGSDGASLTFNGTEYTIAKA---TPATTTPVAPLIPGGITYQA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTNVTFAS-GKGTTATVSKDDQCNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS-- 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              160 LKKIDSDTLGENGFNVN-GKGTITNKAATVSDLTSAGAKLNTTT--GLYGL--KTENTLL 214
                                                                                      22 GTTASDNVDFVR-----TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTTASDNVDFVR-----TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD 76
                                                                                                                            214 LTTDAAFDKLGNGDKVTV----GGVDYTYNAKSGDFTTTK--STAGTGVDAAAQAADSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                239 SSVSLGA------GADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKLVTGKDKGENGSSTDEGEGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQADKFETVTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------GKVISGNVSPSKGKMDETVNINAGNNIEITRNGKN--IDIATSMTPQ
                                                                                                                                                                                                                                                                                                    135 SGTNVTFAS-GKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS-
                                                                                                                                                                                                                                                                                                                                                                                                         --GKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       288 AQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ---AYLPGKSMMAI-----GGG
                                     74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 584;
                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
             ; Pred. No. 0.0091;
59; Mismatches 167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 8.4%; Score 163.5; DB 2; Best Local Similarity 23.4%; Pred. No. 0.041; Matches 91; Conservative 57; Mismatches 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TYRGEAGYAIGYSSISDGGNWIIKGTAS 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         434 T--NVADYTVSYSVNKDNGSVTVAGYAS 459
             22.78;
          Best Local Similarity 22.7 Matches 88; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                         193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        193
                                                                                         δ
                                                                                                                                             ga
                                                                                                                                                                                           ŏ
                                                                                                                                                                                                                                              요
                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                      δy
                                                                                                                                                                                                                                                                                                                                                                                                                                                          염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
C;Species: Escherichia coli
C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001
C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001
C;Accession: F90961
R;Hayashi, T; Makino, K; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han, C.G. gasawara, N.; Yasunaga, T; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H.
DNA Res. 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 and genc
A;Reference number: A99629; MuID:21156231; PMID:11258796
A;Status: preliminary
A;Holecule type: DNA
A;Status: 1-585 <HAY>
A;Coss-references: GB:BA000007; PIDN:BAB36085.1; PID:g13362130; GSPDB:GN00154
A;Experimental source: strain O157:H7, substrain RIMD 0509952
C;Genetics:
A;Gene: ECs2662
C;Superfamily: flagellin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical protein flic [imported] - Escherichia coli (strain O157:H7, substrain EDL93 C; Species: Escherichia coli C; Species: Escherichia coli C; Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 C; Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001 C; Accession: F85809 E; Plunkett III, G.; Burland, V.; Mau, B.; Glasner, J.D.; Rose, D.J.; Mayhew iller, L.; Grotbeck, E.J.; Davis, N.W.; Lim, A.; Dimalanta, E.; Potamousis, K.; Apodaca, A; Title: Genome sequence of enterohemorrhagic Escherichia coli 0157:H7.
A; Reference number: A85480; MUID:21074935; PMID:11206551
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Status: preliminary
A;Molecule type: DNA
A;Rosidues: 1-585 <STO>
A;Cross-references: GB:AE005174; NID:912516024; PIDN:AAG56938.1; GSPDB:GN00145; UWGP:23G
A;Experimental source: strain 0157:H7, substrain EDL933
                                                                                                                                                                        gend
                                                                                         C.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214 LTTDAAFDKLGNGDKVTV----GGVDYTYNAKSGDFTTTK--STAGTGVDAAAQAADSA 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----GKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQF 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKRDALAATLHADVGKSVNGSYTTKDGTV--SFETDSAGNITIGGSQAYVDDAGNLTTNN 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                382 TVSKDVVLS-----ETKAAAATSSITFNSGVLSKTIGFTAGESSDAAKSYVDDKGGI 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKLVTGKDKGENGSSTDEGEGLVTAK-EVIDAVNKAGWRMKTTTANGQTGQAD-KFETVT 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSVSLGA------GADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNV 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           288 AQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ---AYLPGKSMMAI-----GGG 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22 GTTASDNVDFVR----TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SGTNVTFAS-GKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 585;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9.0%; Score 175; DB 2; Length 585;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 9.0%; Score 175; DB 2; Length 58 Best Local Similarity 22.7%; Pred. No. 0.0091; Matches 88; Conservative 59; Mismatches 167; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 T--NVADYTVSYSVNKDNGSVTVAGYAS 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYRGEAGYAIGYSSISDGGNWIIKGTAS 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Gene: fliC
C;Superfamily: flagellin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Experimer
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
```

V

```
Riffelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, J.P. Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B.A.; Science 287, 1809-1815, 2000
A; Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; Ve A; Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.
A; Reference number: A81000; MUID: 20175755; PMID: 10710307
A; Accession: A81019
A; Status: preliminary
A; Residues: 1-364 < TEF>
A; Residues: 1-364 < TEF>
A; Residues: 1-364 < TEF>
A; Coss-references: GB: ABC002548; GB: ABC002098; NID: g7227249; PIDN: AAF42321.1; PID: g722725
                                                                                                                                                                                                                                                                                                       adhesin/invasin, probable NMB1994 [imported] - Neisseria meningitidis (strain MC58 serog
C;Species: Neisseria meningitidis
C;Date: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001
C;Accession: A81019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58 GKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAG----W 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------EAVADTVDKHAEAFNDIADSLDETNTKADEAVKTANEAKQTAEETK-- 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | : | | | | | | 85 G------KQNVDAKVKAAESEIE 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              174 NQLQNSGWNLDSKAVAGSSGK-----VISGNVSPSKGKMDETVNI--NAGNNIEITRNG 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                287 VAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQ---AYLPGKSMMAI-----GG 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        114 RMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNV 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      217 ONVD-----AKVKAAETAAGKAEAAAGTANTAADKAEAVAAKVTD----IKADIAT 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                286 NVAQLKGVAQNLNNRIDNVDGN-----ARAGIAQAIATAGLVQAYLPGKSMMAIGGGT 338
                                        380 ATVSKDVVLS------ETKAAAATSSVTFNSGVLSKTIGFTAGESSDAAKSYVDDKGG 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 RAASVKDV--LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTK-TTTVNVESKD-N 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8.4%; Score 163; DB 2; Length 364;
25:1%; Pred. No. 0.025;
tive 54; Mismatches 145; Indels 108; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34 KAATVAIVAAYNNGQEINGFKAGET-----IYDIGEDGTITQKDATAADVEADDFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              226 KNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             339 YRGEAGYAIGYSSISDGGNWIIK----GTASGNSRG-HFGASASVGYQW 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                337 GTYRGEAGYAIGYSSISDGGNWIIKGTAS 365
                                                                                                                                                     432 IT--NVADYTVSYSVNKDNGSVTVAGYAS 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity 25.1%
Matches 103; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Gene: NMB1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C; Genetics
                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
  ò
                                                                                                               ò
                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ολ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
```

6, 2003, 09:33:40

October

Search completed: Octobook Job time: 11.9348 secs

THIS PAGE BLANK (USPTO)

Mon Oct

GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.

OM protein - protein search, using sw model

October 6, 2003, 09:06:20 ; Search time 5.89906 Seconds (without alignments) 3045.266 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-09-771-382-38 1947 1 NRAASVKDVLNAGWNIKGVK......TASGNSRGHFGASASVGYQW 382

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

127863 seqs, 47026705 residues Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt_41:* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	Description	P15921 rickettsia	_	Q9kka3 r outer mem	es	P14914 rickettsia	Q53047 r outer mem	Q08860 shigella fl	P25927 salmonella	P37710 enterococcu		-	-	7	_	o	O06653 r outer mem			Q9rb65 chlamydia p	r outer me	_		_			_	_	Q9n9x3 euplotes oc	σ.		2251	5827	P35828 caulobacter
SUMMARIES	CI CI	OMPA RICRI	AG43_ECOLI	OMPB_RICCN	YDBA_ECOLI	120K_RICRI	OMPB_RICRI	FLIC_SHIFL	BIGA_SALTY	ALYS_ENTFA	HLYA_SERMA	Y741_CHLMU	FLIC_ECOLI	ICEN_XANCT	PMP8_CHLPN	HLYA_PROMI	OMPB_RICJA	AIDA_ECOLI	YPJA_ECOLI	PM10_CHLPN	OMPB_RICTY	OMPA_RICCN	YADA_YERPS	HXA3_HAEIN	ICEK_PSESX	PVDB_PLAKN	TOP2_PLAFK	YEEJ_ECO57	CX80_EUPOC	ICEV_PSESX	YS89_CAEEL	FLA2_CAMJE	SLAP_CAMFE	SLAP_CAUCR
	DB	-	7	П	Н	П	٦	-	Н	-	Н	П	7	٦	~	-		٦	П		-	-	7	П	П	-	П	-	٦	1	-	-	Η.	П
	Length		1039	1655	2003	1300	1654	550	1953	737	1608	1007	497	1567	930	1577	1656	1286	1569	928	1645	2021	434	917	1148	1153	1398	2660	716	1196	3178	575	933	1025
dP	ery	7.9	٠	٠	٠	7.7	7.7	•	7.3	•	•	•	٠	7.0	٠		•			6.8	٠		٠	6.7			6.7			٠	•		9.9	9.9
	Score	154.5	152.5	152.5	152	150	150	144		139.5		137.5	137		136.5	136		m	134.5	133	133	133	131	131	131	131	131		129.5	129	129	128	128	128
	Result No.	-	73	e	4	Ŋ	9	7	œ	σ	10	. 11	12	13	14	15	16	17	18	19	20	21	22	23	24	52	56	27	28	59	30	31	32	33

949 saccharomyc	P16239 erwinia her P20676 saccharomyc	620 pseudomonas 815 pseudomonas	671 clostridium	kw5 helicobacte	487 caenorhabdi	272 proteus mir	489 yersinia en	252 campylobact
P46 P45	P16 P20	P06	P23	260	P34	P42	P31	P22
YG4A_YEAST HXA2_HAEIN	ICEN_ERWHE NUP1_YEAST	ICEN_PSESY ICEN_PSEFL	AMY_CLOAB	VACA_HELPJ	YMJB_CAEEL	FLC1_PROMI	YADA_YEREN	FLB2_CAMJE
			-	-	Н	Н	-	
817 928	1258 1076	1200	760	1288	918	365	455	575
6.5	6.5	6.5	6.4	6.4	6.4	6.4	6.4	6.4
127	126.5 126	126	125.5	125.5	125	124.5	124.5	124
34 35	36	38 39	40	41	42	43	44	45

ALIGNMENTS

~

```
VARIANT
VARIANT
VARIANT
   1004 NANNGI-VIFIGNSTVIGNV----GNINALATVNVGAGL--LQVQGGVVKANIINLIDN 1055
                                                                                                                                                                                                                                                                                                              1056 ASAVTFTNPVVVTGAIDNTGNANNGIVTFTGNSTVTGNVGN-----TNALATVNVGAG 1108
                                                                                                                                                                                                                                                                                                                                                   25;
                                                                                                                                                                                                                                                                                                                                                                                             944 SQVTGDIGNTNSLATISVGAGTATLGGAVIKATTTKLTDAASAVKFTNPVVVTGAIDNTG 1003
                                                                                                                                                                                                                                                                                                                                    247 ADAPILSVDGDAL -- NVGSKKDN-KPVRITNVAPGVKEGDVINVAQLKGVAQNLNNRIDN 303
                                                                                                                                                                                                                                                                                                                                                                               304 VDGNARA----GIAQAIAT----AGL-VQAYLPGKSMMA-------IGGGT 338
                                                                                                                                                                                                                                                                                                                                                                                                                           339 YRGEAGYALGY---SSISDGGNWIIK------GTASGNSRGH---FGASASVG 379
                                                                                                                                 833 AASVLTLTNANAVLTGAVDNTTGGDNVGVLNLNGALSQVTGDIGNT------NSLAT- 883
                                                                                                                                                                             884 ISVGAGTATLGGAVIKATTTKLTNAASVLTLTNANAVLTGAIDNTTGGDNVGVLNLNGAL 943
                                                                                                                                                                                                  80 --VTGKDKGENGSST-DEGEGLVT----AKEVIDAVNKAGWRMKTTTANGQTGQADKFE 131
                                                                                                              62
                                                                                                                                                        79
                                                                                                             3 AASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTE
                                                                                                                                                                                                                                              132 TVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGS
                                                                                                                                                                                                                                                                                        192 SGKVISGNVSPSKGKMDETVNINAG----NNIEITRNGKNIDIATSMTPQFSSVSLGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE-97251358; PubMed-9097040;
IIODh T., Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K.,
Kasai H., Kimura S., Kitakava M., Kitagawa M., Makino K., Miki T.,
Mizobuchi K., Mori H., Mori T., Motomura K., Nakade S., Nakamura Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=9742667; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V.,
Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F.,
Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
Mau B., Shao Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
NCBL_TaxID=562;
                                                                 Length 2249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                         Indels
K (TYPE II).
L (TYPE II).
M (TYPE II).
TYPE I (INCOMPLETE).
MW; A9D6646C089DF087 CRC64;
                                                                   DB 1;
                                                                                       41; Mismatches 171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AG43_ECOLI STANDARD; PRT; 1039 AA. P39180; P75614; P76360; P97241; Q46771; 01-F8E-1995 (Rel. 31, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 16-CCT-2001 (Rel. 40, Last annotation update) Antigen 43 precursor (AG43) (Fluffing protein). FUO OR B2000.
                                                                              Pred. No. 0.44;
                                                                                                                                                        VKIGAKT----SVIKEKDGKL------
                                                                   7.9%; Score 154.5;
950 1021
1022 1093
1094 1165
1166 1180
2249 AA; 224333 M
                                                                             24.8%;
                                                                                       Matches 119; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=K12 / MG1655;
                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Escherichia coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-K12
                                                                                                                                                       63
                                             SEQUENCE
                                                                   Query Match
                                                                              Local
REPEAT
REPEAT
                       REPEAT
                                  REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AG43_ECOLI
 FT
FT
FT
SO
                                                                                                              ò
                                                                                                                                 q
                                                                                                                                                       ò
                                                                                                                                                                            g
                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                  q
                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                    ŏ
                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                              ŏ
                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIJINE-89291704; PubMed=2661530; Caffrey P., Owen P.; "Purification and N-terminal sequence of the alpha subunit of antigen 43, a unique protein complex associated with the outer membrane of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -I- FUNCTION: CONTROLS COLONY FORM VARIATION AND AUTOAGGREGATION. MAY FUNCTION AS AN ADHESIN.
-I-SUBUNIT: HETERODIMER OF THE PERIPHERAL MEMBRANE PROTEIN (ALPHA CHAIN) ANCHORED TO THE INTEGRAL OUTER MEMBRANE PROTEIN (BETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Link A.J., Robison K., Church G.M.; "Comparing the predicted and observed properties of proteins encoded in the genome of Escherionia coli K.12."; Electrophoresis 18:1259-1313(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Henderson I.R., Meehan M., Owen P.; "Antigen 43, a phase-variable bipartite outer membrane protein, determines colony morphology and autoaggregation in Escherichia coli
Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y. Sivasundaram S., Tagami H., Takeda J., Takemoto K., Wada C., Yamamoto Y., Horluchi T.; A 460 kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ANTIGEN 43 ALPHA CHAIN.
ANTIGEN 43 BEFA CHAIN.
K -> N (IN STRAIN ML 308-225).
SL -> FF (IN STRAIN ML 308-225).
T -> K (IN STRAIN ML 308-225).
W -> L (IN STRAIN ML 308-225).
V -> F (IN STRAIN ML 308-225).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -i- SUBCELLULAR LOCATION: Outer membrane-associated.
-i- SIMILARITY: TO ADHESIN AIDI-I AND TO BORDETELLA PERTACTIN.
                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
STRALN-MI. 308-225;
Henderson I.R., Owen P.;
Submitted (JAN-1997) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Outer membrane; Signal; Complete proteome.
SIGNAL 1 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEMS Microbiol. Lett. 149:115-120(1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TIGRFAMS; TIGR01414; autotrans_barl; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AE000291; AAC75061.1; ALTINIT:
EMBL; D90838; BAA15825.1; ALT_INIT.
EMBL; D90839; BAA15832.1; ALT_INIT.
EMBL; U24429; AAB47869.1; --
HSSP; P07505; ISRD.
ECOGene; EG12686; flu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
InterPro; IPR004899; Pertactin.
Pfam; PF03797; Autotransporter; 1.
Pfam; PF03212; Pertactin; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteriol, 171:3634-3640(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=K12 / EMG2;
MEDLINE=97443975; Pubmed=9298646;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=97257509; PubMed=9103983;
                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY SEQUENCE OF 53-78.
                                                                                                                                                                        DNA Res. 3:379-392(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               551
                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-ML 308-225;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 53-63.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               53
552
2
41
46
157
188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Escherichia col
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENE NAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHAIN
VARIANT
```

m

```
ð
                                                                                                                                                                                                                                                                                                                                                     52 VESKDNGKKTEVKIG-AKTSVIKEKDGKLVTGKDKGENGSSTDE----GEGLV----TAK 102
                                                                                                                                                                                                                                                                                                                    218 ----KNGRQIVRAEGTANTTVV-----YAGGDQTVHGHALDTTLNGGYQYVHNGGTAS 266
                                                                                                                                                                                                                                                                                                                                        EVIDAVNKAGWRM------KTTTANGQTGQADKFETVTSGTNVTFASG----KGTTATV 151
                                                                                                                                                                                                                                                                                                                                                                                                                        211 VNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPV 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----AFSIGGGQADALMLEKGSSFTLN------435
                                                                                                                                                                                                                                                        3 AASVKDVLN-AGWNIKGVKPGTTASDNVDFVRT------YDTVEFLSADTKTTTVN
                                                                                                                                                                                                                                                                                                                                                                                152 SKDDQG-NITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDET
                                                                                                                                                                                                                                                                                                                                                                                                                                                               271 RITHNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKS
                                                                                                                                                                                                                                                                                                                                                                                             323 T----GINRLGAFSVVEGKADNV-VLENGG-RLD-------VLTGHTATN-----
                                                                                                                                                                                                                                                                                                                                                                                                                                          360 TRVDDGGTLDV-RNG----GTATT----VSMGNGG---VLLADSGAAVSGTRSDGK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    09KA3. 09KK98; 09KC45.;
16-0CT-2001 (Rel. 40, Created)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2003 (Rel. 41, Last annotation update)
0uter membrane protein B precursor (168 kDa surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (romps B) (Contains: 120 kDa surface-exposed protein (Surface protein)
antigen) (120 kDa outer membrane protein omps); 32 kDa beta peptide].
                                                                                                                       MNLIYNA (IN STRAIN ML 308.
      N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
N STRAIN ML 308-225).
                                                                                                                                           (IN STRAIN ML 308-225)
                                                                                                                                                                                                                                    126; Indels 121;
                                                                                                                                                                                                                  DB 1; Length 1039;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
NCBI_TaxID=781;
                                                                                                                                                    S -> T (IN STRAIN ML 308-225).

Q -> L (IN STRAIN ML 308-225).

S -> I (IN STRAIN ML 308-225).

ETV -> TTT (IN REF. 5).

W; 5170D647C8DEEBE0 CRC64;
  STRAIN ML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       331 MMAIGGGTYRGEAGYAIGYSSISDGGNWIIKGTASGN 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     : || : | : | : | | ...:| | ---VNGGLFTARGGTLAGTTTLNNGAILTLSGKTVNN
                                                                                                                                                                                                              7.8%; Score 152.5; DE 25.2%; Pred. No. 0.23; ative 50; Mismatches 1
                            LNLVHTS -> N
225).
QGT -> LGA (
S -> T (IN §
                                                                                                                                                             O -> L (IN
S -> I (IN
                                                                                                                                                                                  61 63 ETV
1039 AA; 106841 MW;
                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rickettsia conorii.
                                                                                                                                                                                                                        al Similarity
100; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. STRAIN=Malish 7;
                                                                                                                                          845
855
888
1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OMPB OR RC1085.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OMPB_RICCN
                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                            267
                                                                                                                                                                                                                Query Match
Best Local 9
                                                                                                                                         VARIANT
VARIANT
VARIANT
                                                          VARIANT
VARIANT
VARIANT
                                                                                       VARIANT
VARIANT
VARIANT
                                                                                                                                                                         VARIANT
                   VARIANT
                              VARIANT
                                        /ARIANT
                                                 /ARIANT
                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 3
g
                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                           a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                        ŏ
                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
```

```
between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Stenos J., Walker D.; "The Tickettsial outer membrane protein A and B genes of Rickettsia australis, the most divergent rickettsia of the spotted fever group."; Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10 LNAGWNIKGVKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN----VESKDNG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1655 32 ND BETA PEPTIDE.

61 P - A (IN STRAIN INDIAN TICK TYPHUS).

75 G - S (IN STRAIN INDIAN TICK TYPHUS).

78 K -> N (IN STRAIN INDIAN TICK TYPHUS).

251 V -> A (IN STRAIN INDIAN TICK TYPHUS).

413 N -> D (IN STRAIN INDIAN TICK TYPHUS).

959 N -> D (IN STRAIN INDIAN TICK TYPHUS).

968 N -> T (IN STRAIN INDIAN TICK TYPHUS).

11139 R -> L (IN STRAIN INDIAN TICK TYPHUS).

776 F -> S (IN STRAIN INDIAN TICK TYPHUS).

776 F -> S (IN REF. 3).

1159 E -> D (IN REF. 3).

1159 C -> S (IN REF. 3).

1177 G -> S (IN REF. 3).

11492 H -> R (IN REF. 3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SIMILARITY).
FUNCTION: THE 32 KDA BETA PEPTIDE MAY SERVE AS A MEMBRANE ANCHOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (BY SIMILARITY).
--- SUBCELLIAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A LAYER WITH HEXAGONAL SYMMETRY (BY SIMILARITY).
---- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         87; Gaps
                                                                                                                                                                                                                                                                                                Phylogenetic analysis of members of the genus Rickettsia using the gene coding the outer-membrane protein rOmpB (ompB)."; Int. J. Syst. Evol. Microbiol. 50:1449-1455(2000).
                         Barbe V.,
                                                                                                       evolution in Rickettsia conorii and R. prowazekii.";
                       Ogata H., Audic S., Renesto-Audiffren P., Fournier P.-E., Barbe
Samson D., Roux V., Cossart P., Weissenbach J., Claverie J.-M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 1655;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -!- FUNCTION: THE 120 KDA SURFACE EXPOSED PROTEIN IS A MAJOR STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TIGRFAMS; TIGR01414; autotrans bar1; 2.
Antigen; S-layer; Cell wall; Complete protecme.
CHAIN 1 1334 120 kDa SURFACE-EXPOSED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pred. No. 0.39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 152.5;
                                                                                                                                                                                                                  STRAIN=Indian tick typhus, and Malish
MEDLINE=20393643; PubMed=10939649;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL, AE008659; AAL03623.1; --
EMBL, AF123721; AAF34124.1; --
EMBL, AF129726; AAF34129.1; --
EMBL, AF149110; AAD39533.1; --
EMBL, EPR35; E97835.
InterPro; IPR006315; Autotransport.
InterPro; IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pfam; PF03797; Autotransporter; 1.
MEDLINE=21442074; PubMed=11557893;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         46,
                                                                                                                                                                                                                                                                                                                                                                                                                 353-1655 FROM N.A.
                                                                                                                                                                                        SEQUENCE OF 33-1649 FROM N.A.
                                                                                                                                    Science 293:2093-2098(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1655
61
75
78
78
251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1492
                                                                                                                                                                                                                                                                         Roux V., Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-Malish 7
                                                                                                       Mechanisms of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Simi
Matches 103;
                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF
                                                                                Raoult D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /ARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   179 GRKATINLWQIDEANNTVALEGVSADGATKWQYNHNGELVITGDNATVNNNGKTT---VD 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKDSTGTEINGNNGKVIQDGDLDVSGGGHGIDITGDSATVDNKGTMTVTDPESMGIQIDG 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296 DKAIVNNEG---ESTITNGGTGTQINGDATANNNGKTTVDGKDSTGTEINGNNGKVIQD 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ------GTTATVSKDDQGNITVMYDVNVGDALNVNQ--LQNSGWNLDSKAV 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | :|| :| :| :| :| :| :| 353 GDLDVSGGGHGIDITGDSATV--DNKGTMTVTDPESIGIOVDGDQAVVNNEG---ESAIT 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      67 AKTSV---IKEKDGKLVTGKDKGENG-----SSTDEGEGLVTAKE-----VIDA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   408 NGGTGTQINGDDATANNNGKTTVDGKDSTGTEIAGNNGKVIQDGDLDVSGGGHGIDITGD 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTASDN----VDFVRTYDTVEFLSADTKT-------TTVNVESKDNGKKTEVKIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----VNKAGWRMKTTTANGQTGQADKFETVT-------SGTNVTFASGK----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                189 AGSSGKVISGN--VSPSKGK-----MDETVNINAGNN-----IEITRNGKNIDI-AT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SATVDNKGTMTVTDPESIGIQIDGDQAIVNNEGES---TITNGGTG-----TQING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293 VAQNLNNR-IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSS
           SIMILARITY: TO S. TYPHINGRIUM ORF NEAR CYSG (AC P25928).
CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THE GENE CODING FOR THIS PROTEIN IS INTERRUPTED BY A HYBRID IS2D/IS30C ELEMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7.8%; Score 152; DB 1; Length 2003;
23.5%; Pred. No. 0.52;
ive 55; Mismatches 157; Indels 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 B83A12C8B53220EE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                              53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-APR-1990 (Rel. 14, Created)
01-FEB-1996 (Rel. 33, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
100 kDa surface-exposed protein.
                                                                                                                                                                                                                                                                                                                                                                                                              -> V (IN REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1300 AA
                                                                                                                                                                                                                                                                                                                                                                                           Hypothetical protein; Complete proteome.
CONFLICT 489 489 I -> V (IN
                                                                                                                                                                                                                                                        EMBL; AE000237; AAC74483.1; ALT_SEQ.
EMBL; AE000237; AAC74487.1; ALT_SEQ.
EMBL; D90778; BAA1800.1; ALT_SEQ.
EMBL; D90778; BAA18880.1; ALT_SEQ.
EMBL; D90779; BAA18881.1; ALT_SEQ.
EMBL; X62680; -; NOT_ANNOTATED_CDS.
ECOGENE; EGI1307; ydbA.
                                                                     BETWEEN AMINO ACIDS 839 AND 840.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ISDGGNWIIKGTASGNSRGHFG 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IGDNGTVNNKGDIVVSDTGSIG 584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 205949 MW;
Biochimie 73:1361-1374(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        al Similarity 23.5
104; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                  495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rickettsia rickettsii
                                                                                                                                                                                                                                                                                                                                                                                                                                                 2003 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120K_RICRI
P14914;
                                                                                                                                                                                                                                                                                                                                                                                                              CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120K_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P120.
öλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ŏλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AC DIT OF OS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                --TVGGQQGNKENTVALDNGTTVKFLGNATFNGNTTIAAN-STLQIGGNYTADFVASADG 810
                                                                                         158
                                                                                                                                                                                                      641
                                                                                                                                                                                                                                     211 VNIN---AGNN--IEITRNGKNIDIATSMTPQ----FSSV----SLGAGADAPTLSVDG 256
                 107
                                                    527
                                                                                                                          581
                                                                                                                                                                                                                                                                              701
                                                                                                                                                                                                                                                                                                                                                                                         IATAGLVQ-----AYLPGKSMMAIGGGTYRGEACYAIGYSSISDGGNWIIKGTASGNS 368
                                                                                                                                                                                                                                                                |:::| || || || || SGTHAAELRLGNAGSVFKLADGTVINGKVNQTALVGGALAAGTITLDGSATITG----DI
                                                                                       VNKAGWRMKTTTANGQTGQADKFETVT-----SGTNVTFASGKGTTATVSKDDQGN
                                                                                                                        GNAGG----AAALQGITLANDATKTLTLGGANIIGANGGTINFQANGGTIKLTS--TQNN
                                                                                                                                                                                                    IVVDFDLAIATDQTGVVDASSLTNAQTLTINGKIGTVGANNKTLGQFNIGSSKTVLSDGD
                 · · · · · ENGSSTDEGEGLVTAKEVIDA
                                                                                                                                                               159 ITVMYDV-----NVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKM-DET
                                                                                                                                                                                                                                                                                                                 DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDG-NARAGIAQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Alba H., Baba T., Fujita K., Hayashi K., Inada T., Isono K., Itoh T., Rasai H., Rashimoto K., Kimura S., Kitakawa M., Kitagawa M., Rakaid H., Mashimoto K., Kimura S., Kitakawa M., Kitagawa M., Rakaino K., Miki T., Mizobuchi K., Mori H., Mori T., Moromura K., Nakamira Y., Nashimoto H., Nishio Y., Oshima T., Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takeda J., Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; A. A. Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; A. A. Takeuchi Y., Wada C., Yamamoto Y., Horiuchi T.; A. Takeuchi Y., Mori M., Mada C., Itakeuchi K., Takeuchi Y., Horiuchi T.; A. Corresponding to the 28.0-40.1 min region on the linkage map.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Perna N.T., Burland V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moszer I., Glaser P., Danchin A.; "Multiple IS insertion sequences near the replication terminus in Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Escherichia coli.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN=K12 / MG1655;
MEDLINE-97426617; PubMed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V. Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TDBA_ECOLI STANDARD; PRT; 2003 AA. P3366; P76087; P76088; P76085; P76859; 01-FBE-1994 (Rel. 28, Created) 16-OCT-2001 (Rel. 40, Last sequence update) 16-OCT-2001 (Rel. 40, Last annotation update) Hypothetical protein ydba.
               ---KKTEVKIGAKTSVIKEKDGKLVTGKDKG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=92190338; PubMed=1665988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Enterobacteriaceae; Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 464-2003 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA Res. 3:363-377(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RG 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TG 812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=562;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=K12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-K12
                                                                                                                          528
                                                                                                                                                                                                    582
                                                                                                                                                                                                                                                                            642
                                                                                                                                                                                                                                                                                                                 257
                                                                                                                                                                                                                                                                                                                                                    702
                                                                                                                                                                                                                                                                                                                                                                                         316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      811
                                                  472
                                                                                     108
               59
                                                                                                                                                                                                                                                                                                                                                                                                                            754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YDBA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 4
                                                g
                                                                                                                        ద
                                                                                                                                                               δλ
                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                          q
                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                     ò
```

24;

Gaps

99

145

292

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                            Gilmore R.D. Jr., Joste N., McDonald G.A.;
"Cloning, expression and sequence analysis of the gene encoding the 120 kD surface-exposed protein of Rickettsia rickettsii.";
Mol. Microbiol. 3:1579-1586(1989).
                                                                                                                                                                         MISCELLANEOUS: ITS C-TERMINUS POTENTIALLY MAY BEAR THE EPITOPES CONFERRING ANTIGENICITY TO THE PROTEIN.
SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                       RICKETTSIAL VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION. SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED BY A S-LAYER WITH HEXAGONAL SYMMETRY.
 Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   E09E52C3F647243D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                      Glycoprotein; Cell wall; S-layer.
7 7 N-LINKED (POTENTIAL)
66 66 N-LINKED (POTENTIAL)
86 86 N-LINKED (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ( POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (POTENTIAL)
            Rickettsiaceae; Rickettsieae; Rickettsia
                                                                                                                                                                                                                                                                                                                                                                           TIGR01414; autotrans_barl; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-LINKED
N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-LINKED
N-LINKED
N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                       N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LINKED
                                                                                                                                                                                                                                                                                                                                                      IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                          InterPro; IPR006315; Autotransport.
                                                                                                                                                                                                                                                                                                                                                                 Pfam; PF03797; Autotransporter; 1.
                                                                  MEDLINE-90136087; PubMed-2515418;
                                                                                                                                                                                                                                                                                                                    EMBL; X16353; CAA34402.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   132801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          515
547
547
5593
655
655
710
729
826
844
861
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA;
                                                                                                                                                                                                                                                                                                                                S07575
                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1140
1146
1211
1300
                       NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                PIR; S07575;
                                                                                                                                                                                                                                                                                                                                                                               rigrfams;
                                                                                                                                                                                                                                                                                                                                                                                          Antigen;
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                       InterPro
                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                           CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                             CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
```

```
22;
                                                                           51
                                                                           NRAASVK - - DVLNAGWNIKG - - VKPGTTASDNVDFVRTYD - - - TVEFLSADTKTTTVN - -
                                           Gaps
                         ; Pred. No. 0.41;
50; Mismatches 172; Indels 126;
           DB 1; Length 1300;
           Score 150;
        7.7%;
Query Match
Best Local Similarity 23.09
Watches 104; Conservative
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                 148
                                                                                                                                                   218
                                                                                                                                                                                    190
                                                                                                                                                                                                                                                        222
                                                                                                                                                                                                                                                                                                                           278
                                                                                                                                                                                                                                                                                                                                                             386
                                                                                                                                                                                                                                                                                                                                                                                                                                426
                                                                                                                                                                                                                      277
164
                                              96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ģ
                                                                                                                                                                                                                                                                                                                                                                                                                   105 TAIEASGAGVVQLSGTHAAELRLGNAGSIFKLADGTVINGKVNQTALVGGALAAGTITLD
                                                                                                                 GLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT-SGTNVTFASG-----KGTT
                                                                                                                                                                                       149 ATVSKDDQGNITVMYDV-----NVGDALNVNQLQNSGWN-----LDSKAVA----G
                                                                                                                                                                                                           -- SPSKGKMDETVNINAGNNIEIT
                                                                                                                                                                                                                                                                                                                           RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRIT----NVAPG
                                                                                                                                                                                                                                                                                                                                                           --GTNLGSATNPLAEINFGSKGVNVDT------VLNVGEGVNLYATNITTDANVGSF
                                                --VESKDNG-----GENGSSTDEGE
                                                                                                                                                     165 GSATITGDIGNAGGAAALQRITLAN-----DAKKTLTLGGANIIGAGGGTIDLQANGGT
                                                                                                                                                                                                                                                                                         SSKTVLSNGNVAINELVIGNDGAVQFAHDTYLITRTTNAAGQGKIIFNPVVNNGTTLAA-
                                                                                                                                                                                                                                                                                                                                                                                             VKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16-OCT-2001 (Rel. 40, Last annotation update)
Outer membrane protein B precursor (168 kba surface-layer protein)
(Surface protein antigen) (Cell surface antigen 5) (Sca5) (rOmpa) (rOmp B) (Contains: 120 kba surface-exposed protein (Surface protein antigen) (120 kba outer membrane protein ompB); 32 kba beta peptidel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BY A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gilmore R.D. Jr., Cieplak W. Jr., Policastro P.F., Hackstadt T.; "The 120 kilodalton outer membrane protein (rOmp B) of Rickettsla rickettsli is encoded by an unusually long open reading frame: evidence for protein processing from a large precursor."; MOI. Microbiol. 5:2361-2370(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -!- SUBCELLULAR LOCATION: CELL WALL. THIS BACTERIUM IS COVERED LAYER WITH HEXACONAL SYMMETRY.
-!- SIMILARITY: BELONGS TO THE RICKETTSIAE OMPA/OMPB FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gilmore R.D. Jr., Joste N., McDonald G.A.;
"Cloning, expression and sequence analysis of the gene encodir
120 kD surface-exposed protein of Rickettsia rickettsii.";
Mol. Microbiol. 3:1579-1586(1989).
-!- FUNCTION: THE 120 kDa SURRACE-EXPOSED PROTEIN IS A MAJOR
STRUCTURAL PROTEIN WHICH MAY PLAY A ROLE AS A RICKETTSIAL
VIRULENCE FACTOR AND/OR IMMUNOGEN DURING INFECTION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YRGEAGYAIGYSSISDGGNWIIKGTASGNSRG 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1654 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Rel. 39, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-92167802; PubMed=1724278;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90136087; PubMed=2515418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OMPB_RICRI STANDARD; 6
053047;
30-MAY-2000 (Rel. 39, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 279-1654 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rickettsia rickettsii.
                                                                                                                                                                                                                                                        SSGKVIS-GNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=783;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30-MAY-2000
16-OCT-2001
                                                                                                                 97
                                                                                                                                                                                                                                                        191
                                                                                                                                                                                                                                                                                         278
                                                                                                                                                                                                                                                                                                                                                                                             279
                                                                                                                                                                                                                                                                                                                                                           337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OMPB_RICRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                               q
                                                                                                                 δ
                                                                                                                                                 g
                                                                                                                                                                                     à
                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                              ò
```

```
Flagella.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              384
                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BIGA_SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PR PE
  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ω
between the Swiss Institute of Bioinformatics and the EMBL outstation -
the Buropean Bioinformatics Institute. There are no restrictions on its
use by non-profit institutions as long as its content is in no way
modified and this statement is not removed. Usage by and for commercial
                                            entities requires a license agreement (See http://www.isb-sib.ch/announce/
or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                22;
                                                                                                                                                                                                                                                                                                                                                                148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               690
                                                                                                                                                                                                                                                                                          NLAAQIKVPNAITLIGNFTGDASNPGNTAG-----VITFDANGTLESASADANVAVTNNI 458
                                                                                                                                                                                                                                                                                                                                                                                                            149 ATVSKDDQGNITVMYDV-----G 190
                                                                                                                                                                                                                                                                                                                                                                                                                                   631
                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----SPSKGKMDETVNINAGNNIEIT 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  279 VKEGDVTNVAQLKGVAQNLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGT 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----ALENGTIVKFLGNAT 780
                                                                                                                                                                                                                                                                                                                  96
                                                                                                                                                                                                                                                                                                                                                               GLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVT-SGTNVTFASG-----KGTT
                                                                                                                                                                                                                                                                                                                                                                            --VESKDNG------KKTEVKIGAKTSVIKEKDGKLVTGKDK-----GENGSSTDEGE
                                                                                                                                                                                                                                                                                                                                        459 TAIEASGAGVVQLSGTHAAELRLGNAGSIFKLADGTVINGKVNQTALVGGALAAGTITLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRIT----NVAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --GINLGSATNPLAEINFGSKGVNVDT-----VLNVGEGVNLYATNITTDANVGSF
                                                                                                                                                                                                                                                                    1 NRAASVK--DVLNAGWNIKG--VKPGTTASDNVDFVRTYD---TVEFLSADTKTTTVN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              632 SSKTVLSNGNVAINELVIGNDGAVQFAHDTYLITRTINAAGQGKIIFNPVVNNGTTLAA-
                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Shigella flexneri.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Shigella.
                                                                                                                                                                                                                        Score 150; DB 1; Length 1654;
Pred. No. 0.54;
50; Mismatches 172; Indels 126;
                                                                                                                                                               120 kDa SURFACE-EXPOSED PROTEIN
                                                                                                                                                                                                  168184 MW; D7AB70FB7087F618 CRC64;
                                                                                                                                                                           32 kDa BETA PEPTIDE. POLY-THR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         741 VFNAGGTNIVS-GTVGGQQGNKFNTV------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                339 YRGEAGYAIGYSSISDGGNWIIKGTASGNSRG 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                550 AA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              : | | :: | | | : | | | ENGNTTIAAN-STLQIGGNYTADCVASADGTG
                                                                                                                           Pfam; PF03797; Autotransporter; 1.
TIGRFAMS; TIGR01414; autotrans_barl; 2.
                                                                                                                  IPR005546; Autotransporter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSGKVIS-GNV-----
                                                                              EMBL; X16353; CAA34403.1; -.
PIR; S18227; S18227.
InterPro; IPR006315; Autotransport.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN=IID642;
MEDLINE=94335647; PubMed=8057852;
                                                                                                                                                                                                                        7.78;
                                                                                                                                                   Antigen; S-layer; Cell wall.
CHAIN 1 1333
                                                                                                                                                                                                                                   Best_Local Similarity 23.09
Matches 104; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1995 (Rel. 32, C)
01-NOV-1995 (Rel. 32, La
01-NOV-1995 (Rel. 32, La
Flagellin
FLIC OR SF1966.
                                                                                                                                                                           1654
                                                                                                                                                                          1334 165
1181 118
1654 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=623;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FLIC_SHIFL
Q08860;
                                                                                                                   InterPro;
                                                                                                                                                                                                                                                                                                                 22
                                                                                                                                                                                                                                                                                                                                                              97
                                                                                                                                                                                                                                                                                                                                                                                     519
                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                        DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 7
FLIC_SHIFL
                                                                                                                                                                            CHAIN
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ŏ
                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   102 GTNSDSDLDSIQDEIKSRLDEIDRVSGQTQFNGVNVLAKDGSMK--IQVGANDGQTITID 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Genome sequence of Shigella flexneri 2a: insights into pathogenicity through comparison with genomes of Escherichia coli K12 and 0157."; Nucleic Acids Res. 30:4432-4441(2002).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTTASDNVDFVR-----TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKLVTGKDKGENGSSTDEGEGL---VTAKEVIDAVNKAGWRMKTTTANGQTG--QADKFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               160 LKKIDSDTLGLNGFNVNGGGAVANTAASKADLVAANATVVGNKYTVSAGYDAAKASDLLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             132 TVTSGTNV--TFASGKGTTATVS--KDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       220 GVSDGDTVQATINNGFGTAASATNYKYDSASKSYSFDTTTASAADVQKYLTPG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VAGSSGK---VISGNVSPSKGKMDETVNINAGNNI-----EITRNGKNIDIATSMTPQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -VGDTAKGTITIDGSAQDVQISSDGKITASNGDKLYIDTTGRLTKNGS----GASLTEAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239 SSVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                328 LSTLAANNTKATTIDIGGTSISF-TGNSTTPDTITYSVTGAK---VDQAAFDKAVSTSGN
                                                                                                                                                                                                                                                      STRAIN=301 / Serotype 2a;
MEDLINE=22272406; PubMed=12384590;
Jin Q., Yuan Z., Xu J., Wang Y., Shen Y., Lu W., Wang J., Liu H.,
Yang J., Yang F., Zhang X., Zhang J., Yang G., Wu H., Qu D., Dong J.,
Sun L., Xue Y., Zhao A., Gao Y., Zhu J., Kan B., Ding K., Chen S.,
Cheng H., Yao Z., He B., Chen R., Ma D., Qiang B., Wen Y., Hou Y.,
Tominaga A., Mahmoud M.A.-H., Mukaihara T., Enomoto M.; "Molecular characterization of intact, but cryptic, flagellin genes in the genus Shigella.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299 N-----RIDNVDGNARAGI-----AQAIATAGLVQAYLPGKSMMAIGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7.4%; Score 144; DB 1; Length 55:
21.5%; Pred. No. 0.33;
Live 55; Mismatches 167; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CC921C9A8EF200B6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT; 1953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIR; S44980; S44980.
InterPro; IPR001029; Flagellin_C.
InterPro; IPR001492; FlagellinN.
Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
                                                                                                                                   Microbiol. 12:277-285(1994)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BICA_SALTY STANDARD; 1
P25927; P25928; Q9XCQ3;
01-MAY-1992 (Rel. 22, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AE015215; AAN43516.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   550 AA; 56636 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; D16819; BAA04093.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRINTS; PR00207; FLAGELLIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match 7.4 Best Local Similarity 21.5 Matches 76; Conservative
                                                                                                                                                                                                                         SEQUENCE FROM N.A.
```

14;

_

```
91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ALYS_ENTFA
P37710;
                                                                  Query Match
Best Local S
Matches 91
                                                                                                                                                                                                                                                                                                                                                           510
    CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                       462
                                                                                                                                                                                                                                                                                                                                                                                                             558
                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ALYS_ENTFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 9
     FFF
                                                                                                                                              g
                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                       ó
                                                                                                                                                                        ŏ
                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                J. Bacteriol. 173:325-333(1991).
-!- CAUTION: Ref.3 sequence differs from that shown due to frameshifts in positions 414 and 732.
                                                                                                                                                                                                                       MEDLINE-21534948; PubMed-11677609; MCLelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., MCCLelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., Courtney L., Porwoldik S., Ali J., Dante M., Du F., Hou S., Layman D. Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulvaney E., Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M., "Complete genome sequence of Salmonella enterica serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                                                                             Wu J.Y., Siegel L.M., Kredich N.M.;
"High-level expression of Escherichia coli NADPH-sulfite reductase:
requirement for a cloned cysG plasmid to overcome limiting siroheme
                                                              Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
NCBL_TaxID=602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PUTATIVE SURFACE-EXPOSED VIRULENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DRGDDDVTPPDD (IN REF. 1).
R (IN REF. 3).
28-FEB-2003 (Rel. 41, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Putative surface-exposed virulence protein bigA precursor.
                                                                                                                                            Stojiljkovic I., Valentine P., Heffron F.; "Salmonella typhimurium rhs homolog."; Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROTEIN BIGA.
15 X 11 AA TANDEM REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Stygene; SG10437; bigA.
Virulence; Repeat; Signal; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (INCOMPLETE).
(INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (INCOMPLETE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POTENTIAL.
                                                                                                                                                                                                            STRAIN-LT2 / SGSC1412 / ATCC 700720;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; M64606; AAA27042.1; ALT_FRAME.
EMBL; M64606; AAA27043.1; ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ^ ^
                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-91100301; PubMed-1987123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AF133696; AAD39458.1; -. EMBL; AE008859; AAL22340.1; -.
                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 1-765 FROM N.A.
                                                                                                                                                                                                                                                                                                                              Nature 413:852-856(2001).
                                                     Salmonella typhimurium.
                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                  STRAIN-ATCC 14028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             101
101
104
1123
1123
1124
1126
1167
1189
1189
                                        BIGA OR STM3478
                                                                                                                                                                                                                                                                                                                                                                       STRAIN=LT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                       cofactor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CHAIN
```

```
20;
                                                                                                                                                                                                                                                                                                                                                                                                               366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 461
                                                                                                                                                                                                                                                                                                                                 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.

STRAIN=V583 / ATCC 700802;

MEDLINE=22550857; PubMed=12663927;

MEDLINE=22550857; PubMed=12663927;

Paulsen I.T., Banerjei L., Myers G.S.A., Nelson K.E., Seshadri R.,
Read T.D., Fouts D.E., Eisen J.A., Gill S.R., Heidelberg J.F.,
Tettelin H., Dodson R.J., Umayam L., Brinkac L., Beanan M.,
Daugherty S., DeBoy R.T., Durkin S., Kolonay J., Madupu R., Nelson W.,
Vamathevan J., Tran B., Upton J., Hansen T., Shetty J., Khouri H.,
Utterback T., Radune D., Ketchum K.A., Dougherty B.A., Fraser C.M.;
"Role of mobile DNA in the evolution of vancomycin-resistant
                                                                                                                                                                                                                                                                                                                                                                            180 GWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68 KTSVIKEKDGKLVTGKDKGEN----GSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123 QTGQADKFETVTSGTNVTFASGKGTTATVSKD---DQGNITVMYDVNVGDALNVNQLQNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              G-----AGSTGTVIDGNNARVNNDGDMTIT-DGGTGGHITGDNVVIDNAGSTTV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240 SVSLGAGADAPTLSVDGD---ALNVGSKKDNKPVRITNVAPGVK-EGDVTNVAQLKGVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296 NLNNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----GDILVTDG
                                                                                                                                                                                                                                                                                                                                     13 GWNI----KGVKPGTTASDNVDFVRTYDTVEFL-SADTKTTTVNVESKDNGKKTEVKIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103 TINTISGHSTVDNATG-ALISGNGTTINFAGDIAVSGGGTAIIIDGDNATIKNTGTSDIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Enterococcus faecalis (Streptococcus faecalis).
Bacteria; Firmicutes; Lactobacillales; Enterococcaceae; Enterococcus.
                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FUNCTION: Hydrolyzes the cell wall of E.faecalis and M.lysodeikticus. May play an important role in cell wall growth
                                                                                                                                                                                                                           ed. No. 1.8;
Mismatches 144; Indels 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=91358349; PubMed=1679432; Beliveau C., Potvin C., Trudel J., Asselin A., Bellemare G.; "Cloning, sequencing, and expression in Escherichia coli of & Streptococcus faccalis autolysin."; J. Bacteriol. 173:5619-5623(1991).
                                                                                                                                                                                    Score 142; DB 1; Length 1953; Pred. No. 1.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15-SEP-2003 (Rel. 42, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
Autolysin precursor (EC 3.2.1.-) (Peptidoglycan hydrolase)
                                                                                                         200150 MW; 611B3F1C954D91AE CRC64;
D -> N (IN REF. 1).
QYLE -> ITLQ (IN REF. 1).
SA -> T (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      356 GNWIIK-GTASGNSRGHFGASA----SVGY 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----VDGAGSAAVIINGDNGSLTQA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            587 AMGIITYGT -- GNEAKNTGNATVRDADSVGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                      48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-1994 (Rel. 30, Created)
                                                                                                                                                                                    7.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Enterococcus faecalis.";
Science 299:2071-2074(2003).
                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
1698
1798
1837
1698 169
1795 179
1836 183
1953 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Beta-glycosidase).
                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=1351;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ID DDT TD ```

```
DEFINED
 marcescens.
 HLYA_SERMA
 STRAIN-SN8
 SEQUENCE
 603
 57
 157
 328
 881
 SIGNAL
 RESULT 10
HLYA_SERMA
 ò
 g
 Qγ
 g
 ŏ
 g
 ò
 OD
 δ
 a
 ŏ
 a
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modifited and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 15;
 60 KTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDE-GEGLVTAKEVIDAVNKAGWRMKTT 118
 393 GDLIFVGQKLIVKKGASGN--TG-GSGSGSNNNQSGTNTYTTVKSGDTLNKIAAQYGVS 449
 TANGQTGQADKFETVTSGTNVTF---ASGK--GTTATVSKDDQGNITVMYDVNVGDALN- 172
 222 TRNGKNIDIATSMTPQFSSVSLGAGADAPTL----SVDGDAL-----NVGSKK 265
 221
 559 NQSGTNTYYTIKSGDTLNKISAQFGVSVANLQAWNNISGSLIFAGQKIIVKKGANSGSTN 618
 29
 510 IAAQYGVSVANLRSWNGISGDLIFAGQKIIVKKGTSGNTGGSS------NGGSN--N
 DVLNAGWNIKG -- VKPGTTASDNVDFVRTY -- -- - DTVEFLSADTKTTTVNVESKDNGK
 450 VANLRSWNGISGDLIFVGQKLIVKKGASGNTGGSNNGGSNNNQSGTNTYYTIKSGDTLNK
 -----VNQLQNSGWNLDSKAVAGSSGKVI-----SGNVSPSKGKMDETVNINAGNNIEI
 SUBCELLULAR LOCATION: Secreted (Probable).
DOMAIN: LYSM REPEATS ARE THOUGHT TO BE INVOLVED IN PEPTIDOGLYCAN
 Gaps
 65;
 DB 1; Length 737;
 SIMILARITY: BELONGS TO FAMILY 73 OF GLYCOSYL HYDROLASES. SIMILARITY: Contains 6 LysM repeats.
 Indels
 Hydrolase; Glycosidase; Bacteriolytic enzyme; Cell wall;
Cell division; Septation; Repeat; Signal.
SIGNAL
1 53 POTENTIAL.
 -> T (IN REF. 1).
-> S (IN REF. 1).
ISSING (IN REF. 1).
ABB16BD506AC7507 CRC64;
 7.2%; Score 139.5; DB 1;
23.5%; Pred. No. 0.81;
ive 40; Mismatches 145;
 REF
 619 TNKP---TNNGGGATTSYTIKSGDTLN 642
 DNKPVRITNVAPG-----VKEGDVTN 286
 AUTOLYSIN
 LYSM 1.

LYSM 2.

LYSM 3.

LYSM 4.

LYSM 4.

LYSM 5.

LYSM 6.

T > V (C
 InterPro; IPR002901; Amidase_4.
InterPro; IPR002482; LysM.
 EMBL; M58002; AAA67325.1; -. EMBL; AE016949; AAO80613.1; -.
 77025 MW;
 Pfam; PF01832; Amidase_4; 1.
Pfam; PF01476; LysM; 5.
 Conservative
 SMART; SM00257; LYSM; 6.
SMART; SM00047; LYZ2; 1.
cell separation.
 405
 PIR; A38109; A38109.
TIGR; EF0799; -.
 484
567
737 AA;
 Similarity
 431
499
567
695
695
118
143
 449476
 Query Match
Best Local Simil
Matches 77; C
 BINDING
 CONFLICT
CONFLICT
CONFLICT
 CONFLICT
CONFLICT
SEQUENCE
 æ
 119
 566
 333
 173
 CONFLICT
 CONFLICT
 REPEAT
REPEAT
REPEAT
 REPEAT
REPEAT
 REPEAT
 CHAIN
 g
δ
 셤
 ŏ
 q
 ōλ
 q
 ò
 ŏ
 a
 õ
 g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bloinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 21;
 107
 108 VNKAGWRM-----KTT------KTT-138
 -----TVSKDDQ 156
 217 NNIEITRNGKNIDIATSMTPQFSSVSLGA------GADAPTLSVDGDALNVGSK 264
 99
 NALSTTVDKIDARTGTAFNI-----TSSSHKADNSYQSSTASELKSDTNLTLVSHKDAD
 GNLT----INARDKLTQQGAQHSVGGAYQENAAGVDHLAAADTASTTTTKTDVGVNI---
 1 NRAASVKDVLNA----GWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKD
 -NGKKT----EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVT----AKEVIDA
 768 VSFLAADDKTASNTEQTKIGGGFYYTGGIDKLGSGVEAGYENNKTQAQSSKAITSGSDVK
 GNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAG
 Gaps
 Poole K., Schiebel E., Braun V.; "Molecular characterization of the hemolysin determinant of Serratia
 ERYTHROCYTE BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. SHLA REQUIRES SHLB FUNCTION.
 J. Bacteriol. 170:3177-3188(1988).
-!- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD
CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARL)
 FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM
 Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
 7.1%; Score 139; DB 1; Length 1608;
21.6%; Pred. No. 2.1;
Live 52; Mismatches 176; Indels 168;
 08 HEMOLYSIN.
165078 MW; D669B476FE7DAD51 CRC64;
 SUBCELLULAR LOCATION: Outer membrane. SIMILARITY: TO P.MIRABILIS HEMOLYSIN (HPMA).
 01-APR-1990 (Rel. 14, Created)
01-APR-1990 (Rel. 14, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
1608 AA
 SEQUENCE FROM N.A., AND SEQUENCE OF 31-40.
 Hemolysis; Toxin; Outer membrane; Signal.
 PRT;
 MEDLINE=88257037; PubMed=3290200;
 Enterobacteriaceae; Serratia.
 EMBL; M22618; AAA50323.1; -.
 139 VTFASGKGTTA-----
 Query Match 7.1.
Best Local Similarity 21.6
Matches 109; Conservative
 1608
 Hemolysin precursor.
 1608 AA;
 Serratia marcescens
 PIR; A28182; A28182
 NCBI_TaxID=615;
```

```
136 GTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGWNLDSKAVAGSSGKV 195
 (Rel. 05, Created)
(Rel. 05, Last sequence update)
(Rel. 42, Last annotation update)
 497 AA
 Hanafusa T., Sakai A., Tominaga A., "Isolation and characterization of Imutants whose hag48 expression has b
 237 QFSSVSLGAGADAPTLS-----
 PRT;
 Bacteriol. 168:1479-1483(1986)
 MEDLINE-97251358; PubMed-9097040;
 MEDLINE=87057066; PubMed=3536885;
 MEDLINE=89281489; PubMed=2659972;
 Gen. Genet. 216:44-50(1989).
 360 IKGTAS----GNSRGH 371
 866 IPGETTLAELLPRLRGH 882
 OR FLAF OR HAG OR B1923
 STANDARD;
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 Escherichia coli.
 Flagellin.
FLIC OR FLAF OR
Escherichia coli
 NCBI_TaxID=562;
 repressor."
 15-SEP-2003
 13-AUG-1987
 13-AUG-1987
 FLIC_ECOLI
P04949;
 STRAIN-K12
 196
 FLIC_ECOLI
 g
 g
 δy
 g
 οy
 qq
 δy
 q
 δ
 g
 ò
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the SWISS Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 SRDTR-----GSAG-VRVYTTTGSDLTVDAKGEGGTQRSNSSASQAVTGSIDAANGIN 1043
 26;
 991
 -----GENGSSTDEGEGLVTAKE----VIDAVNKAGWRMKTTTANGQTGQADKFETVTS 135
 82
 K--DNKPVRITNVAPGV----KEGDV----TNVAQLKGVAQNLN------NRIDNV
 933 KRSSSSQAVVSSVQAGSIDINAKGEVRDQGTQYQASKG-AVNLTADSHRSEAAANRQDEQ
 DGNARAGIAQAIATAGLVQAYLPGKSMMAIG----GCTYRGEAGYAIGYSSISDGGNW--
 9 VLNAGWNIKGVK----TTVNVE-TASDNVDFVRTYDTVEFLSADTKT---TTVNVE
 STRAIN-MODD / Nigg;
MEDLINE-20150255; PubMed-10684935;
Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S.,
Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R.,
Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L.
Eisen J., Fraser C.M.;
 Gaps
 ; Score 137.5; DB 1; Length 1007;
; Pred. No. 1.5;
52; Mismatches 165; Indels 171;
 "Genome sequences of Chlamydia trachomatis MoPn and Chlamydia pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
-!- SIMILARITY: BELONGS TO THE CHLAMYDIAL CPN0572/CT456/TC0741
FAMILY.
 Chlamydia muridarum.
Bacteria; Chlamydiae; Chlamydiales; Chlamydiaceae; Chlamydia.
 SKDNGKKTEVKIGAKTSVIKEKDG----KLVTGKDK-------
 HYPOTHETICAL PROTEIN TC0741 IN; 842800C0871B1518 CRC64;
 Hypothetical protein; Signal; Complete proteome.
 (Rel. 40, Created)
(Rel. 40, Last sequence update)
(Rel. 40, Last annotation update)
 PRT; 1007 AA
 1044 VNVKKDAIYQGTALNGGRGKTAVNA 1068
 POTENTIAL
 359 -----IIKGTASGNSRGHFGASA 376
 Hypothetical protein TC0741 precursor. TC0741.
 52 1007 HYPO
1007 AA; 104006 MW;
 EMBL; AE002342; AAF39550.1; -.
 n 7.18;
Similarity 21.98;
 Conservative
 STANDARD;
 1007
 PIR; H81670; H81670.
TIGR; TC0741; -.
 SEQUENCE FROM N.A.
 NCBI_TaxID=83560;
 16-OCT-2001
 Y741_CHLMU
Q9PJT6;
 16-OCT-2001
 109;
 16-OCT-2001
 992
 SEQUENCE
 54
 305
 265
 Query Match
 86
 Local
 SIGNAL
 Matches
 ŏ
 g
 ò
 g
 g
 ð
 ద
 ò
```

```
644
 236
 317
 817
 | ::| : || ::|| ::|| 645 ILAAVRKHLDTVYPGENGGSTEGPL--PANQNIGNVIHDVEQNGAAQE--TIITPGDTES 700
 701 TDTSSSVNANADLEDVSDADSGFGDDDGISDTESTNGNDSGKNTPVGDGGTPSGPDILAA 760
 818 PIGLA-SLLPATPSTPLMTTPRTNGKAAASSLMIKGGETQA------KLVKNGGN-- 865
 Kuwajima G., Asaka J.-I., Fujiwara T., Fujiwara T., Node K., Kondo E.;
"Nucleotide sequence of the hag gene encoding flagellin of
 318 TAGLVQAYLP------GK----SK----SMMAIGGGTYRGEAGYAIGYSSISDGGNWI
 , Enomoto M.;
Escherichia coli hag operator
become repressible by a Salmonella
598 DADVEDTS--DTDSGIGDDD-----GVSDTESTNG-NNSGKTTSTEENGDPSGPD
 ---RITNVAPGVKEGDVTNVAQLKGVAQNLNNRIDNVDGNA------RAGIAQAIA
 I-----SGNVSPSKGKMDETVNINAGNNI-EITRNGKNIDIATSMTP----
 SEQUENCE FROM N.A.
STRAIN=KIZ. / MG1657.
STRAIN=KIZ. / MG1657; PubMed=9278503;
Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V., Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
 Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Escherichia.
 Itoh T., Aiba H., Baba T., Fujita K., Hayashi K., Inada T.,
ISONO K., Kasal H., Kimura S., Kitakawa M., Kitagawa M.,
Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,
Nakade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T.,
 ---VDGDALNVGSKKDNKPV--
 "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
```

```
279 TSGGTPVQIDNTAGSATANLGAVSLVKLQDSKGNDTDTYALKDTNGNLYAADVNETTGAV
 SIEGVYTDNGNDYYAKITGGDNDGKYYAVTVANDGTVTMATGATANATVTDANTTKATTI
 ---VTFASGKGTTATVSKDD-----
 -QGNITVMYDVNVGD-----ALNVNQLQNS-GWNLDSKAVAGSSGKVISGNVSPSKGKM
 -----DETVNINAGNNIEITRNGKNIDIATSMTPQFSSVSLGAGADAPTLSVDGDAL
 339 SVKTITYTDSSGAASSPTAVKLGGDDGKTEVVDIDGKTYDSADLNGGNLQTGLTAGGEAL
 N-VGSKKDNKPVRITNVAPGVKE-----GDVTNVAQLKGVAQNLNNRIDNVDGNARAGI
 Xanthomonas campestris pv. translucens.";
Mol. Gen. 223:163-166(1990).
Mol. Gen. 223:163-166(1990).
Mol. TCE NUCLEATION PROTEINS ENABLE BACTERIA TO NUCLEATE CRYSTALLIZATION IN SUPERCOOLED WATER.
MOLETULAR LOCATION: Outer membrane (By similarity).
MOMAIN: CONTAINS 133 IMPERECT REPEATS OF THE CONSENSUS OCTAPEPTIDE A-G-Y-G-S-T-L-T; FURTHER ON A 16-RESIDUE AND A
 Xanthomonas campestris (pv. translucens).
Bacteria; Proteobacteria; Gammaproteobacteria; Xanthomonadales;
Xanthomonadaceae; Xanthomonas.
 Zhao J., Orser C.S.; {}^{*} "Conserved repetition in the ice nucleation gene inaX from
 Ice nucleation; Repeat; Outer membrane.
SEQUENCE 1567 AA; 152548 MW; C8B451D959ECAD63 CRC64;
 7.0%; Score 137; DB 1;
11.9%; Pred. No. 2.6;
 01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
 Ą
 313 AQA-----IATAGLVQAYLPGKSMMA 333
 PS00314; ICE_NUCLEATION; 57.
 InterPro; IPRO00258; Ice_nucleatn.
Pfam; PF00818; Ice_nucleation; 81.
PRINTS; PRO0327; ICENUCLEATN.
PROSITE; PS00314; ICE_NUCLEATON;
 MEDLINE-91080859; PubMed-2259339;
 ----DKFETVTSGTN-
 EMBL; X52970; CAA37140.1; -. HSSP; P06620; 11NA.
 21.9%;
 Ice nucleation protein.
 SEQUENCE FROM N.A.
 NCBI_TaxID=343;
 ICEN_XANCT
P18127;
 219
 260
 208
 156
 Query Match
 INAX.
 g
 д
 g
 Qγ
 δy
 δ
 δλ
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isp-sib.ch).
 77 GKLVTGKDKGENGSSTDEGEGLVTAKEV-----IDAVNKAGWRMKT--TTANGQTGQA 127
 92
 GTTASDNVDFVR----TYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKD
 GINSESDLSSIQDEIKSRLDEIDRVSGQTQFNGVNVLAKNGSMK -- IQVGANDNQTITID
 Szekely E., Simon M.;
"DNA sequence adjacent to flagellar genes and evolution of flagellar-
 Link A.J., Robison K., Church G.M.; "Comparing the predicted and observed properties of proteins encoded in the genome of Escherichia coli K-12."; Electrophoresis 18:1259-1313(1997).
 Gaps
 5
 proteome projects.";
J. Mol. Blol. 278:599-608(1998).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES
FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
 84;
Saito N., Sampei G., Seki Y., Sivasundaram S., Tagami H., Takkda J., Takmoto K., Wada C., Yanmanoto Y., Horiuchi T.; A 460-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 40.1-50.0 min region on the linkage map.";
 STRAIN=K12 / W3110;
MEDLINE=98263247; PubMed=9600841;
W11kins M.R., Gasteiger E., Tonella L., Ou K., Tyler M.,
Sanchez J.-C., Gooley A.A., Walsh B.J., Bairoch A., Appel R.D.,
Williams K.L., Hochstrasser D.F.;
"Protein identification with N and C-terminal sequence tags in
 7.0%; Score 137; DB 1; Length 497; 20.6%; Pred. No. 0.71; ive 71; Mismatches 154; Indels
 SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 24B5419C21C7B4E8 CRC64;
 P -> L (IN REF. 2)
 [5]
SEQUENCE OF 1-19 FROM N.A.
MEDLINE=83238225; PubMed=6305924;
 MEDLINE-97443975; PubMed-9298646;
 Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
PRINTS; PR00207; FLAGELLIN.
 EMBL; AE000285; AAC74990.1; -.
 phase variation.";
J. Bacteriol. 155:74-81(1983).
 51163 MW;
 EMBL; M14358; AAA23950.1; -. EMBL; X17440; CAA35488.1; -.
 Flagella; Complete proteome.
 80; Conservative
 Res. 3:379-392(1996).
 497 AA;
 / EMG2;
 Similarity
 SEQUENCE OF 1-12
 SEQUENCE OF 1-4
 22
 SEQUENCE
 Query Match
Best Local
 Matches
 g
 ò
 δ
 a
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
 the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 15;
 Gaps
REGIONAL 48-RESIDUE PERIODICITY IS SUPERINDOSED.
MISCELLANEOUS: A STRUCTURAL MODEL IS SUGGESTED IN WHICH THE ICE
NUCLEATION PROTEIN DISPLAYS A SYMMETRY RELATED TO THAT OF ICE.
SIMILARITY: BELONGS TO THE BACTERIAL ICE NUCLEATION PROTEIN
FAMILY.
 82;
 Length 1567;
 Indels
 ; Pred. No. 2.6;
46; Mismatches 176;
 Conservative
 l Similarity
85; Conserv
 Best Local
Matches 8
```

```
97669 MW;
 88; Conservative
 930
 930 AA;
 Best Local Similarity
 FROM N.A.
 CONFLICT
 155
 198
 243
 294
 Query Match
 SIGNAL
 CHAIN
 Matches
ò
 g
 g
 q
 a
 d
 ò
 qq
 ŏ
 δý
 δ
 δ
 qq
 ò
 999 GSDVTAGYGSTGTAGADSTLIAGYGSTQTAGSDSSLTAGYGSTQTARQGSDVTAGYGSTG 1058
 300 RIDNVDGNARAGIAQA----IATAGLVQAYLPGKSMMAIGGGTYRGEAGYAI--GYSSIS 353
 MEDINE-2015025; PubMed-10684935;
MEDINE-2015025; PubMed-10684935;
MEDINE-2015025; PubMed-10684935;
Mead T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S.,
Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R.,
Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L.,
Eisen J., Fraser C.M.;
"Genome sequences of Chlamydia trachomatis MoPn and Chlamydia
pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
 STRAIN-VR1310;
MEDLINE-20007584; PubMed-10539856;
Christiansen G., Boesen T., Hjerno K., Daugaard L., Mygind P.,
Madsen A.S., Knudsen K., Falk E., Birkelund S.;
"Molecular biology of Chlamydia pneumoniae surface proteins and their
role in immunopathogenicity.";
Am. Heart J. 138:S491-S495(1999).
 ---YGSTGTAGADSTLIAGYGSTQTSGSDSSLTAGYGST-QTARKG-----SDMTAGYG
 STGT-AGADSTLIAGYGSTQTSGSD-----SSLTAGY------GSTQTARE
 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 817 TGTAGADSTLIAG----YGSTQTSGS-----DSSLTAGYGSTQTAREGSDVTAGY
 130 FETVTSGTNVTFASGKGTTATVSKDDQGNITVMY------DVNVGDALNVNQLQNS
 GWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFS
 LNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
 VTAGYGSTG-----TAGADSTLIAGYGSTQTSGSDSSLTAGYGSTQTARKGSDITAGYGS
 363 GSTGTAGADSTLISGYGSTQTAGSD--SSLTAGYGSTQTARKGSDVTAG-----
 SVSLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNN
 PWP8_CHLPN STANDARD; PRT; 930 AA.
092393; 098B66;
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
17-0CT-2001 (Rel. 40, Last annotation update)
18-0CT-2001 (Rel. 40,
 Kalman S., Mitchell W., Marathe R., Lammel C., Fan J., Hyman R.W., Olinger L., Grimwood J., Davis R.W., Stephens R.S., "Comparative genomes of Chlamydia pneumoniae and C. trachomatis.";
 | : : | | : | | 1059 TAGADSTLIAGYGSTQTAGS-DSSLTAGY 1086
 DGG--NWIIKGTASGNSRGHFGASASVGY 380
 STRAIN=CWL029;
MEDLINE=99206606; PubMed=10192388;
 Genet. 21:385-389(1999)
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 70
 180
 910
 240
 096
 354
 PMP8_CHLPN
 g
 셤
 qq
 g
 ò
 g
 ò
 ò
 g
 ò
 ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the SWISS Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 18;
 197
 242
 256
 293
 351
 343
 96 EGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKFETVTSGTNVTFASGKGTTATVSKD- 154
 95
 91
 34 IDSFDGAGGSTFTPKSTADANG--INYVLSGNVYINDAGKGTALTGCCFTETTGDLTFTG
 ------DQGNITVMYDVNV-----GDALNVNQLQNSGWNLDSKAVAGSSGKVIS
 144 LSSAGALNLTDNG--TILFSQNVSNEANNNGGAITTKTLSISG-NTSSITFTSNSAKKLG
 | : | ::: | | : : | : : : | 1 | : : | 201 GAIYSSAA---ASISGNTGQLVFMNNKGETGGGALGFEASSSIT-QNSSLFFSGNTATDA
 LGAG-----ADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDV-TNVAQLKGV
 AQNL -- NNRIDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSS
 -----SGSLSLSANQGD
 37 IVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGE-NGSSTDEG
 Shirai M., Hirakawa H., Kimoto M., Tabuchi M., Kishi F., Ouchi K., Shiba T., Ishii K., Hattori M., Kuhara S., Nakazawa T.; Comparison of Whole genome sequences of Chlamydia pneumoniae J138 from Japan and CWL029 from USA."; Nucleic Acids Res. 28:2311-2314(2000).
 POTENTIAL.
PROBABLE OUTER MEMBRANE PROTEIN PMP8.
T -> A (IN REF. 3 AND 4).
46A9B5E3BB913C4C CRC64;
 (POTENTIAL).
 GNVSPSKGKMDETVNINAGNNIEITRNGK -----NIDIATSMTPQFSSV---
 TIGREAMS; TIGRO1414; autotrans_barl; 1.
TIGREAMS; TIGRO1376; POMP_repeat; 6.
Outer membrane; Signal; Multigene family; Complete proteome.
 DB 1;
 48; Mismatches 156;
 9
 GPTLFSNNRC----GNTAAGKGGAIAIAD----
 7.0%; Score 136.5; 22.6%; Pred. No. 1.6
 ISDGGNWIIKGTASGNSRG--HFGASASV 378
 |: || : :| : :| 344 ITFLGNTLTSTSAPTSTRNAIYLGSSAKI 372
 InterPro; IPR005546; Autotransporter.
InterPro; IPR003368; Chlamydia_PMP.
 InterPro; IPR006315; Autotransport.
MEDLINE=20330349; PubMed=10871362;
 Pfam; PF03797; Autotransporter; 1.
Pfam; PF02415; DUF145; 2.
 EMBL; AJ133034; CAB37068.1; --
EMBL; AE001627; AAD18590.1; --
EMBL; AE002193; AAF38164.1; --
EMBL; AP002546; BAA98654.1; --
PIR; A81591; A81591
PIR; DZ0788; D72078; PLCI 2DPAGE; Q92393; --
TIGR; CP0307; --
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 993 TTFHETKGGGQIGVSTK----TGSDITVAIKGEGQTTDNALMETKAKGSQFTSNGDISI 1047
 54 SKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDA-VNKAG 112
 113 WRMKTTTANGQTGQADKFETVTSGTNVTFA-SGKGTTA-----TVSKDDQGNITVMYDV 165
 166 NVGDALNVNQLQNSGWNLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITR-- 223
 -!- SUBCELLULAR LOCATION: Outer membrane.
-!- MISCELLANEOUS: THE CONSERVED AMPHIPATHIC DOMAINS IN SHLA AND HPMA MAY BE RESPONSIBLE FOR PORE FORMATION.
-!- SIMILARITY: TO S.MARCESCENS HEMOLYSIN (SHLA).
 6 VKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLS--ADTKTTTVNVE-----
 SEQUENCE FROM N.A., AND SEQUENCE OF 30-43.
STRAIN=Isolate 477-12;
MEDLINE=90110827; PubMed=2407716;
MEDLINE=90110827; PubMed=2407716;
Wholeotide sequencing of the Proteus mirabilis calcium-independent hemolysin genes (hpmA and hpmB) reveals sequence similarity with the Serratia marcescens hemolysin genes (shlA and shlB).";
J. Bacteriol. 172:1206-1216(1990).
-I- FUNCTION: BACTERIAL HEMOLYSINS ARE EXOTOXINS THAT ATTACK BLOOD CELL MEMBRANES AND CAUSE CELL RUPTURE BY MECHANISMS NOT CLEARLY
 Gaps
 DEFINED.
-1- FUNCTION: CELL-BOUND HEMOLYSIN, WHICH RELEASES HEME-IRON FROM ERYTHROCYTES BY INTERACTION WITH THE ERYTHROCYTE MEMBRANE. HPMA REQUIRES HPMB FUNCTION.
 Proteus mirabilis.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
 Indels 126;
 7.0%; Score 136; DB 1; Length 1577; 23.0%; Pred. No. 3; ive 58; Mismatches 141; Indels 120
 30 1577 HEMOLYSIN.
1577 AA; 165869 MW; 175975E0C924B2D9 CRC64;
 01-AUG-1990 (Rel. 15, Created)
01-AUG-1990 (Rel. 15, Last sequence update)
01-NOV-1990 (Rel. 16, Last annotation update)
PRT; 1577 AA
 Hemolysis; Toxin; Outer membrane; Signal.
SIGNAL 1 29
 23.08; F1.
 Enterobacteriaceae; Proteus.
NCBI_TaxID=584;
 EMBL; M30186; AAA25657.1; -.
 Best Local Similarity 23.0 Matches 97; Conservative
STANDARD;
 Hemolysin precursor.
 PIR; A35140; A35140
HLYA_PROMI
 SEQUENCE
 Query Match
 qq
 ŏ
 a
 a
 ò
 ŏ
 ò
 요
```

6, 2003, 09:24:20

Search completed: October Job time: 7.89906 secs

```
18661.5
18661.5
18661.5
18661.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.5
18860.
 6, 2003, 09:13:10 ; Search time 28.0565 Seconds (without alignments) 3513.485 Million cell updates/sec
 1 NRAASVKDVLNAGWNIKGVK.....TASGNSRGHFGASASVGYQW 382
 830525
 5.1.6
Compugen Ltd
 Total number of hits satisfying chosen parameters:
 830525 seqs, 258052604 residues
 version :
 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
 - protein search, using sw model
 SPTREMBL_23:*
1: Sp_archea:*
2: sp_bacteria:*
3: sp_fung1:*
4: sp_human:*
5: sp_invertebrate:*
5: sp_mammal:*
5: sp_mc:*
 BLOSUM62
Gapop 10.0 , Gapext 0.5
 GenCore
Copyright (c) 1993
 Minimum DB seq length: 0
Maximum DB seq length: 200000000
 US-09-771-382-38
 October
 Title:
Perfect score:
 Scoring table:
 OM protein
 Searched:
 Sequence:
 Database
 Run on:
```

Q9jps0 neisseria m Q9jpt0 neisseria m Q9jpt7 neisseria m Q9jpt7 neisseria m Q9jpt8 neisseria m Q9jpt8 neisseria m Q9jpt8 neisseria m Q9jpt9 neisseria m Q9jpt5 neisseria m Q9jpt5 neisseria m Q9jpt0 neisseria m Q9jpt0 neisseria m Q9m70 haemophilus Q8m70 haemophilus Q8m70 haemophilus Q8m70 haemophilus Q8m70 haemophilus Q8m70 haemophilus Q8m70 haemophilus Q8fpt6 vylella fas Q9pc04 xylella fas Q8cd4 escherichia Q8fcb2 besteriala pe Q8ch10 yersina pe Q8ch10 yersina pe Q8ch10 yersina pe

Q9JPS8 Q9JPS8 Q9JPH0 Q9JPS5

## 9: sp\_page:\* 10: sp\_plant:\* 11: sp\_rodent:\* 13: sp\_vertebrate:\* 13: sp\_vertebrate:\* 15: sp\_vertebrate:\* 16: sp\_bacteriap:\* 17: sp\_archeap:\* 17: sp\_archeap:\* 17: sp\_archeap:\* 18: the number of results predicted by chance to have a

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

|           | Description              | Q93qy3 neisseria m | Q9jps7 neisseria m | Q9jr18 neisseria m | Q9aqf0 neisseria m | Q9jps4 neisseria m | Q9jps1 neisseria m | Q9jps6 neisseria m | Q9jps9 neisseria m | Q9jps3 neisseria m | 093qy4 neisseria m | 09jpi3 neisseria m | Q9jps2 neisseria m | Q9jpr8 neisseria m |        | Q9jpr9 neisseria m | Q93qy2 neisseria m |
|-----------|--------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------|--------------------|--------------------|
| SUMMARIES | ID                       | Q93QY3             | Q9JPS7             | Q9JR18             | Q9AQF0             | Q9JPS4             | Q9JPS1             | Q9JPS6             | Q9JPS9             | Q9JPS3             | Q93QY4             | Q9JPI3             | Q9JPS2             | Q9JPR8             | о9лрн7 | Q9JPR9             | 093QY2             |
|           | DB                       | ~                  | 7                  | 16                 | ~                  | 7                  | 7                  | ~                  | ~                  | 7                  | 7                  | 7                  | 7                  | 7                  | 7      | 7                  | ~                  |
|           | Query<br>Match Length DB | 591                | 591                | 591                | 592                | 526                | 530                | 009                | 592                | 290                | 594                | 594                | 594                | 599                | 594    | 598                | 592                |
| ф         | Ouery<br>Match           | 99.7               | 99.7               | 7.66               | 99.2               | 98.6               | 98.6               | 97.7               | 97.4               | 97.0               | 6.96               | 6.7                | 2.96               | 96.6               | 96.3   | 96.3               | 92.6               |
|           | Score                    | 1941               | 1941               | 1941               | 1937               | 1920               | 1920               | 1903               | 1895.5             | 1889.5             | 1886.5             | 1883.5             | 1883.5             | 1881.5             | 1874.5 | 1874.5             | 1861.5             |
|           | Result<br>No.            | 1                  | 7                  | e                  | 4                  | 2                  | φ                  | 7                  | 8                  | 6                  | 10                 | 11                 | 12                 | 13                 | 14     | 15                 | 16                 |

| ທ  |  |
|----|--|
| Ę  |  |
| À  |  |
| Ξ  |  |
| ຣົ |  |
| 5  |  |
| ¥  |  |
|    |  |

QBKQM8 Q9PD50 Q9PC04 Q8XDG4 Q8ZL64 Q8FCB2 Q9F2D8

Q8CKM1 Q8ZHJ0 Q9F3X5

Q8GM78 Q9F3X6

09JPI 093QYI 048152 08GM79 08GM76 08GM74 P71401 08GM75

us-09-771-382-38.rspt

~

```
451 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 510
 MEDLINE-2017575; PubMed=10710307;
MEDLINE-2017575; PubMed=10710307;
Fettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson K.E., Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J., Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K., Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B.A., Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dougherty B.A., Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J., Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L., Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.; Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.";
 SPECIES-N.meningitidis; STRAIN-PMC21;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Pidentification and characterization of a gene encoding a novel outer
membrane proctein of Netsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF226375; AAF42524.1;
EMBL, AF226367; AAF42516.1;
EMBL, AF226379; AAF42519.1;
EMBL, AF226374; AAF4253.1;
EMBL, AF226374; AAF4253.1;
EMBL, AF226374; AAF4253.1;
 MEDLINE-20175756; PubMed=10710308; Parally MEDLINE-20175756; PubMed=10710308; Parally MEDLINE-20175756; PubMed=10710308; Parally Median M.W., Arico' B., Parally M., Jennings G.T., Bardi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Rnapp B., Blair E., Mason T., Tettelin H., Moxon E.R., Grandi G., Rappuoli R.; Granoff D.M., Venter C., Indentification of Vaccine Candidates Against Serogroup B. Meningococcus by Whole-Genome Sequencing.";
 01-0cT-2000 (TrEMBLrel. 15, Created)
01-0cT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 12, Last annotation update)
01-0CT-2002 (USBELLEL. 12, Last annotation update)
01-0CT-2002 (Adhesin) (NhhA outer membrane
 Neisseria meningitidis, and
Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 62112 MW; 7C22F3CAE7F73EC6 CRC64;
 591
 PRT;
 GTASGNSRGHFGASASVGYQW 382
 Science 287:1809-1815(2000).
 InterPro; IPR005594; YadA. Pfam; PF03895; YadA; 1.
 protein).
GNA992 OR NMB0992 OR NHHA.
 PRELIMINARY;
 NCBI_TaxID=487, 491;
 Complete proteome.
SEQUENCE 591 AA;
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 NMB0992;
 362
 09JR18;
 09JR18
 RESULT 3
 09JR18
 qq
 δλ
 ŏ
 g
 242 SIGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
 390
 331 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 390
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
A Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti E., Mora M., Nuti S.,
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Brooker M., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.;
Tidentification of Vaccine Candidates Against Serogroup B
Amingococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
R EMBL, AF25556; AAF4255:1;
R Interpro: IPR005594; YadA.;
R Pfam; PF03895; YadA.;
R Pfam; PF03895; YadA.;
R SEQUENCE 591 AA; 62113 MW; 533453CAE5A91E1F CRC64;
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 Gaps
 .
0
 Length 591;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBL_TaxID=487;
 Indels
 Created)
Last sequence update)
Last annotation update)
 99.7%; Score 1941; DB 2; 100.0%; Pred. No. 4.8e-84;
 591 AA
 Mismatches
 PRT;
 GTASGNSRGHFGASASVGYQW 382
 MEDLINE=20175756; PubMed=10710308;
 99.7°,
100.0%; Pre-
0; }
 Outer membrane protein GNA992
 Q9JPS7;
01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2002 (TrEMBLrel. 22,
 Matches 381; Conservative
 PRELIMINARY;
 Neisseria meningitidis.
 Similarity
 SEQUENCE FROM N.A.
 STRAIN-B2147
 511
 362 (
 182
 302
 62
 571
 122
 331
 Query Match
 242
 Local
 09JPS7
 RESULT 2
 q
 ò
 g
 δ
 g
 ð
 셤
 ò
 ò
 g
 δ
 g
 ò
 a
 q
 ð
 ò
```

m

oct

Mon

g

ò g ò g ŏ g ç 셤

g õ

ò

```
205
 121
 265
 325
 241
 181
 385
 301
 241
391
 451
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
 61
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
 332 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
 122 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 266 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGN
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 SLGAGADAPTLSVDGDALNVGSKKDNRPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
 2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Gomanducci M., Jannings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Brocker M., Hundt E., Khapp B., Blair E., Mason T., Tettelln H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Tidentlification of Vaccine Candidates Against Serogroup B. Meningococus by Whole-Genome Sequencing.";
 ö
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Indels
 Length
 54732 MW; F543C4234AF807CA CRC64;
 Q9JPS4;
0-CCT-2000 (TrEMBLrel. 15, Created)
01-CCT-2000 (TrEMBLrel. 15, Last sequence update)
01-CCT-2002 (TrEMBLrel. 22, Last annotation update)
 Score 1920; DB 2;
Pred. No. 4.1e-83;
1; Mismatches 3.
 526 AA
 PRT;
 GTASGNSRGHFGASASVGYQW 382
 MEDLINE=20175756; PubMed=10710308;
 Outer membrane protein GNA992 GNA992.
 98.6%;
99.0%;
 EMBL; AF226377; AAF42526.1;
InterPro; IPR005594; YadA.
 Conservative
 PRELIMINARY;
 Pfam; PF03895; YadA;
SEQUENCE 526 AA;
 1 Similarity
377; Conserv
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 STRAIN-NG6/88
 242
 242
 Query Match
Best Local $
 62
 452
 302
 512
 362
 Q9JPS4
 Matches
 S
 RESULT
 09JPS4
 g
 g
 g
 δ
 Ω
 δ
 a
 δ
 Qγ
 g
 δ
 셤
 à
 q
 ò
 g
 ő
 ö
 271
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
 61
 STRAIN-MC58;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.;
"Identification and characterisation of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (FEB-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF125375; AAK09243.1;
InterPro; IPR005594; YadA.
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 Gaps
 Gaps
 ő
 ö
 591;
 Length 592;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 1; Indels
 Length
 Indels
 62290 MW; 168986A97381EFC5 CRC64;
 Created)
Last sequence update)
Last annotation update)
 Score 1941; DB 16;
Pred. No. 4.8e-84;
 ö
 Score 1937; DB 2;
Pred. No. 7.5e-84;
 592 AA
 Mismatches
 0; Mismatches
 PRT;
 GTASGNSRGHFGASASVGYQW 382
 99.7%; Scc...
100.0%; Pre
 99.5%;
 17,
17,
 380; Conservative
 Conservative
 PRELIMINARY;
 (TrEMBLrel.
 (TrEMBLrel.
 Outer membrane protein.
NHHA.
Neisseria meningitidis.
 Incerro, Pfam; PF03895; Yada; REGUENCE 592 AA;
 Similarity
 Similarity
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 01-JUN-2001 (
01-JUN-2001 (
01-OCT-2002 (
 381;
 Query Match
Best Local S
Matches 381
 7
 62
 211
 62
 122
 331
 182
 391
 242
 451
 302
 511
 362
 Match
 122
 Local
 09AQF0;
 Q9AQF0
 Matches
 RESULT 4
 Query
 Q9AQF0
```

ð g ò 셤 ολ

ö

```
510 GTASGNSRGHFGASASVGYQW 530
 Best Local Similarity
Matches 375; Conserv
 SEQUENCE FROM N.A.
 400
 460
 62
 302
 362
 Query Match
 122
 Q9JPS9
 RESULT 7
09JPS6
 RESULT 8
 09JPS9
 g
 οχ
 g
 QQ
 ò
 염
 δŽ
 g
 ŏ
 g
 δ
 δy
 241
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 445
 361
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 SLGAGADAPILSVDGDALNVGSKKDNKPVRIINVAPGVKEGDVINVAQLKGVAQNLNNRI 449
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI 301
 DNVDGNARAGIAQAIATAGIVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK 361
 2 RAASVKDVLNAGWNIKGVKPGTIASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B Meningococus by Whole-Genome Sequencing.";
 ;
0
 Length 530;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Indels
 EMBL, AF226380, AAF42529.1; -.
InterPro, IPRO05594; YadA.
Pfam: PF03895; YadA: 1.
SEQUENCE 530 AA; 55190 MW; IF836CA57598515B CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
 Score 1920; DB 2;
Pred. No. 4.1e-83;
1; Mismatches 3
 530 AA
 PRT;
 STRAIN=NGF26;
MEDLINE=20175756; PubMed=10710308;
 GTASGNSRGHFGASASVGYQW 382
 GTASGNSRGHFGASASVGYQW 382
 98.6%;
99.0%;
 Matches 377; Conservative
 PRELIMINARY;
 Neisseria meningitidis.
 Local Similarity
 FROM N.A.
 362
 150
 62
 210
 122
386
 446
 182
 390
 450
 302
 242
 302
 362
 Query Match
 RESULT 09JPS1
 A PAC CON CONTRACT CO
 qq
 ŏ
 g
 ò
 g
 δ
 δ
 d
 ŏ
 ద
 οy
 g
 δ
 g
 ŏ
 g
```

```
399
 301
 361
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 220 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKKT
 2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 242 SLGAGADAPTLSVDGDALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNRI
 DNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWIIK
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Cadacotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zoo P., Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Mocod D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.", Science 287:1816-1820(2000).

EMBL, AR226371, AAR422020.1: -.
 ;
0
 DB 2; Length 600;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 Indels
 FEMILY PF03895; YadA; 1.
SEOUENCE 600 AA; 62762 MW; 36256963E0598CD1 CRC64;
 Last sequence update)
Last annotation update)
 97.7%; Score 1903; DB 2
98.4%; Pred. No. 3e-82;
tive 0; Mismatches
 AA.
 592
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last seq
01-0CT-2002 (TrEMBLrel. 22, Last anno
 09JPS9;
01-OCT-2000 (TrEMBLrel. 15, Created)
 GTASGNSRGHFGASASVGYQW 382
 MEDLINE=20175756; PubMed=10710308;
 Outer membrane protein GNA992
 Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Conservative
PRELIMINARY;
 AG AG
```

ö

S

```
[1]
SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 STRAIN-EG327;
 STRAIN=NGE28
 62
 301
 122
 Q93QY4
 RESULT 10
 0930Y4
 ò
 Q
 ŏ
 Q
 g
 ò
 Dp
 ò
 ò
 à
 g
 ò
 g
 SLGAGADAPTLSVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW 181
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV 241
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
 1;
 Length 592;
 Bacteria; Proteóbacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Score 1895.5; DB 2; Length
Pred. No. 6.7e-82;
0; Mismatches 5; Indels
 PF03895; Yada; 1.
SEOUENCE 592 AA; 61917 MW; 4A3471514FD3C879 CRC64;
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last senotation update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
GNA992.
01-OCT-2000 (TrEMBLrel. 15, Last sequence update) 01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
 KGTASGNSRGHFGASASVGYQW 382
 STRAIN-860800;
MEDLINE-20175756; Pubmed-10710308;
 EMBL; AF226361; AAF42510.1; -.
InterPro; IPR005594; YadA.
 r-zuuz (TrEMBLrel. 22, La
membrane protein GNA992
 97.48;
 98.48;
 Best_Local Similarity 98.4 Matches 376; Conservative
 GNA992.
Neisseria meningitidis.
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 361
 62
 301
 Query Match
 122
 331
 182
 451
 RESULT 9
 g
 g
 g
 ολ
 ò
 ò
 qq
 Š
 d
 ò
 셤
 ò
 셤
 à
```

```
ij
 388
 448
 300
 328
 181
 241
 360
 508
 121
 61
 182 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 242 SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.; "Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis."; Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157605; AAK68866.1; -.
 Gaps
 pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Brocker M., Hundt E., Khapp B., Blair E., Mason T., Tettelin H., Moxon E.R., Grandi G., Rappuoli R.; Grandif D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Marchetication of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
 1;
 Score 1889.5; DB 2; Length 590;
Pred. No. 1.3e-81;
2; Mismatches 5; Indels 1;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 61661 MW; 8AA476AC300D80C8 CRC64;
 Last sequence update)
Last annotation update)
 594 AA
 01-DEC-2001 (TrEMBLrel. 19, Created) 01-DEC-2001 (TrEMBLrel. 19, Last seq 01-OCT-2002 (TrEMBLrel. 22, Last anno NhhA outer membrane protein.
 569 KGTASGNSRGHFGASASVGYQW 590
 361 KGTASGNSRGHFGASASVGYQW 382
 PRT;
MEDLINE=20175756; PubMed=10710308;
 EMBL; AF226378; AAF42527.1; -. InterPro; IPR005594; YadA. Pfam; PF03895; YadA; 1. SEQUENCE 590 AA; 61661 MW;
 97.0%;
 Query Match 97.0°
Best Local Similarity 97.9°
Matches 374; Conservative
 PRELIMINARY;
```

61

181 392 241 300

```
301 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
 213 RAASVKDVLNAGWIIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT 272
 62 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGGLVTAKEVIDAVNKAGWRMKTTTAN 121
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 33 GQTGQADKFETVTSGTKVTFASGNGTTATVSKDDQGNITVKYDVNVGDALNVNQLQNSGW
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Rapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon B.R., Grandi G., Rappuoli R.;

"Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
 .;
;
 Length 594;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales; Neisseriaceae; Neisseria. NCBI_TaxID=487;
 Query Match 96.7%; Score 1883.5; DB 2; Length Best Local Similarity 97.6%; Pred. No. 2.5e-81; Matches 373; Conservative 1; Mismatches 7; Indels
 62114 MW; 1E2A63A78F53D256 CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
 594 AA
 KGTASGNSRGHFGASASVGYQW 382
 PRT;
 STRAIN=NGE31;
MEDLINE=20175756; Pubmed=10710308;
 Outer membrane protein GNA992.
GNA992.
 EMBL; AF226379; AAF42528.1;
InterPro; IPR005594; YadA.
 PRELIMINARY;
 Neisseria meningitidis.
 Pfam; PF03895; YadA; CECHENCE 594 AA; C
 SEQUENCE FROM N.A.
 213
 393
 453
 513
 361
 273
 N
 62
 122
 242
 09JPS2
 RESULT 12
Q9JPS2
 g
 δŽ
 qq
 Ω
 qq
 Óχ
 qq
 οχ
 g
 ò
 g
 ò
 g
 g
 Š
 Qγ
 q
 1;
 452
 272
 332
 572
 181
 392
 241
 SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
 301 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 61
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPOFSSV
 FTRAIN-NG3/88, and B2232;
MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Pizza M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Brocker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
Moxon E.R., Grandi G., Rappuoli R.;
"Identification of Vaccine Candidates Against Serogroup B
Meningococus by Whole-Genome Sequencing.";
 Gaps
 Gaps
 ij
 ä
 Score 1886.5; DB 2; Length 594;
Pred. No. 1.8e-81;
3; Mismatches 5; Indels 1;
 96.7%; Score 1883.5; DB 2; Length 594; 97.6%; Pred. No. 2.5e-81; 1ve 1; Mismatches 7; Indels 1;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 Pfam; PF03895; YadA; 1.
SEQUENCE 594 AA; 62086 MW; 1B25E03B90D04B46 CRC64;
 594 AA; 62297 MW; 9DDD48B04B3A8EA2 CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
 594 AA
 KGTASGNSRGHFGASASVGYQW 382
 PRT;
 EMBL; AF226376; AAF42525.1; -. EMBL; AF226369; AAF42518.1; -.
 96.9%;
97.6%;
 ilarity 97.6%;
Conservative
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 594 AA; 62297
 InterPro; IPR005594; Yada.
 Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Matches 373; Conservative
 PRELIMINARY;
 Similarity
 Similarity
 [1]
SEQUENCE FROM N.A.
 373;
 ~
 213
 122
 182
 393
 573
 242
 453
 513
 361
 Query Match
 62
 Query Match
 Local
 Best Local
Matches 37
 09JPI3;
 GNA992.
 RESULT 11
 Q9JPI3
 S 28 28
 ò
 đ
 g
 QQ
 ò
 q
 ò
 g
 ò
 셤
 A PACA CONTRACT OF THE CONTRAC
 g
 ŏ
 ò
 ò
```

i,

셤 ö g ŏ q ò a ŏ

```
181
 360
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 121
 397
 241
 300
 457
 61
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 338 GOTGOADKFETVTSGTNVTFASGKGTTATVSKDDOGNITVKYDVNVGDALNVNQLQNSGW
 2 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 301 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
 SLGAGADAPTLSVDG-DALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 novel outer
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti B., Marchetti E., Mora M., Nuti S Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zovino S., Scarselli M., Storni E., Zuo Hood D.W., Jeffries A.C., Sanders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B
 Peak I. R., Stikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel on membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF226388; AAF42517.1;
EMBL, AF226388; AAF42507.1;
EMBL, AF226388; AAF42507.1;
EMBL, AF26638; AAF42507.1;
EMBL, AF26638; AAF42507.1;
FORME, AF26638; AAF4
 ;;
 594;
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992 (NhhA outer membrane protein).
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 tch 96.3%; Score 1874.5; DB 2; Length al Similarity 97.4%; Pred. No. 6.6e-81; 372; Conservative 1; Mismatches 8; Indels
 62361 MW; 436BDDED68263C5C CRC64;
 Ą.
 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
 594
 KGTASGNSRGHFGASASVGYQW 382
 SEQUENCE FROM N.A.
STRAIN=BZ198, and 297-0;
MEDLINE=20175756; PubMed=10710308;
 PRT;
 PRELIMINARY;
 Neisseria meningitidis.
 Query Match
Best Local Similarity
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 GNA992 OR NHHA.
 STRAIN-BZ198
 361
 62
 SEQUENCE
 122
 09JPH7:
 09JPH7
 Matches
 14
 RESULT 1
Q9JPH7
 ACCOORDING TO THE STANDARD OF
 qq
 Dp
 ò
 a
 ŏ
 g
 ōλ
 g
 δ
 õ
 à
 241
 SLGAGADAPTLSVDGD-ALNVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR 300
 301 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII 360
 121
 181
 61
 Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF126383; AAF42532.1;
EMBL; AF157608; AAK68869.1;
InterPro; IPR005594; YadA.
 EVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN
 GQTGQADKFETVTSGTNVTFASGKGTTATVSKDDQGNITVMYDVNVGDALNVNQLQNSGW
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVHTYDTVEFLSADTKTTTVNVESKDNGKRT
 RAASVKDVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKT
 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMTPQFSSV
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hoxdo D.W., Jeffiles A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B
 ;
 599;
 01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992 (NhhA outer membrane protein).
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 Score 1881.5; DB 2; Length
Pred. No. 3.1e-81;
1; Mismatches 7; Indels
 62844 MW; BBA16EBF53C1970C CRC64;
 by Whole-Genome Sequencing.";
 599
 Created)
 KGTASGNSRGHFGASASVGYQW 382
 STRAIN=NGH38;
MEDLINE=20175756; PubMed=10710308;
 Science 287:1816-1820(2000).
 96.68;
97.68;
 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2002 (TrEMBLrel. 22,
 Neisseriaceae; Neisseria.
 Local Similarity 97.6 les 373; Conservative
 PRELIMINARY;
 GNA992 OR NHHA.
Neisserla meningitidis.
 PF03895; Yada; 1
NCE 599 AA; 62
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 Meningococcus
 218
 ~
 62
 333
 242
 182
 361
 SEQUENCE
 Query Match
122
 Q9JPR8
 09JPR8
 Matches
 Best
```

DDT TO DD T TO

Ĥ

à g ò q

```
360
 397 NLDSKAVAGSSGKVISGNVSPSKGKMDETVNINAGNNIEITRNGKNIDIATSMAPQFSSV
 SLGAGADAPTLSVDGD-ALINVGSKKDNKPVRITNVAPGVKEGDVTNVAQLKGVAQNLNNR
 IDNVDGNARAGIAQAIATAGLVQAYLPGKSMMAIGGGTYRGEAGYAIGYSSISDGGNWII
 KGTASGNSRGHFGASASVGYQW 382
 KGTASGNSRGHFGASASVGYQW 598
 301
 361
 242
 457
```

2003, 09:30:54

ý

completed: October He : 29.0565 secs -

```
Amino acid sequence
A surface protein
A surface protein
N. meningitidis PM
N. meningitidis EG
BASBO29 amino acid
A surface protein
A surface protein
 N. meningitidis PM
 6, 2003, 09:05:45; Search time 17.261 Seconds (without alignments) 1848.329 Million cell updates/sec
 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
 1. (SIDSI) goddata/geneseq/geneseqp-embl/AA1980.DAT:*
2. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
3. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
4. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
5. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
6. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
7. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
8. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
9. (SIDSI) goddata/geneseq/geneseqp-embl/AA1981.DAT:*
10: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1981.DAT:*
11: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1981.DAT:*
12: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
13: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
14: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
15: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
16: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
17: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
18: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
19: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1991.DAT:*
20: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1999.DAT:*
21: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1999.DAT:*
22: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1999.DAT:*
23: (SIDSI) goddata/geneseqy-geneseqp-embl/AA1999.DAT:*
23: (SIDSI) goddata/geneseqy-geneseqp-embl/AA2002.DAT:*
24: (SIDSI) goddata/geneseqy-geneseqp-embl/AA2002.DAT:*
24: (SIDSI) goddata/geneseqy-geneseqp-embl/AA2002.DAT:*
24: (SIDSI) goddata/geneseqy-geneseqp-embl/AA2002.DAT:*
 1 SANTLKAGDNLKIKQFTYSL.....AGWRMKTTTANGQTGQADKF 201
 Description
 1107863
5.1.6
Compugen Ltd.
 Total number of hits satisfying chosen parameters:
 1107863 seqs, 158726573 residues
 SUMMARIES
GenCore version
Copyright (c) 1993 - 2003
 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
 protein search, using sw model
 AAU06186
AAY27202
AAY23741
AAY23746
AAU06171
AAU06175
AAY23737
AAY23733
 BLOSUM62
Gapop 10.0 , Gapext 0.5
 A_Geneseq_19Jun03:*
 a
 length: 0
length: 2000000000
 0015500555
 US-09-771-382-39
1018
 DB
 Query
Match Length
 502
591
591
591
591
591
592
598
 October
 94.1
94.1
94.1
94.1
93.7
993.7
 100.0
 sed
 1018
 957.5
957.5
957.5
957.5
957.5
 Title:
Perfect score:
 Scoring table:
 Score
 Minimum DB
Maximum DB
 OM protein
 Sequence:
 Searched:
 Database
 Run on:
 Result
 Ş
No
```

```
Haemophilus influe
Haemophilus influe
Haemophilus influe
Haemophilus influe
 A surface protein
N. meningitidis H1
A surface protein
N. meningitidis P2
A surface protein
N. meningitidis E2
Amino acid sequenc
N. meningitidis PW
N. meningitidis PA
N. meningitidis PA
N. meningitidis PA
M. meningitidis PA
M. meningitidis PA
M. meningitidis PA
Amino acid sequenc
Haemophilus adhesi
meningitidis BZ
surface protein
meningitidis H3
surface protein
meningitidis BZ
 Haemophilus influe
Haemophilus adhesi
N. meningitalis PM
Haemophilus influe
N. meningitidis PM
Haemophilus adhesi
 A surface protein
N. meningitidis H3
A surface protein
N. meningitidis B2
A surface protein
BASBUS amino acid
N. meningitidis EG
 Neisserial conserv
Neisserial conserv
M. catarrhalis sur
 Haemophilus influe
 Surface antigen NhhA; meningococcal disease; meningitis vaccine; mutant; mutein.
 Location/Qualifiers
1..49
50..1501
50..1502
/labbl= Mature_NhhA_deletion_mutant_#4
/note= "Predicted mature protein, specifically claimed in claim 12"
 N. meningitidis PMC21 NhhA deletion mutant #4
 ALIGNMENTS
 AAB23860
AAR99392
AAU06185
AAB23858
AAB23858
 AAY23740
AAY57044
AAU06174
AAY23742
 AAU06180
AAV27203
AAU06182
AAU06181
AAU06183
AAY27201
AAR99393
 AAB23854
AAB23856
AAB23859
 AAY23739
AAU06179
 AAY23745
AAU06173
 AAR99394
AAB23855
 AAB23857
 AAB37827
AAB37828
 AAY23744
AAU06172
 AAU06176
 Neisseria meningitidis strain PMC21 Synthetic.
 AAU06186 standard; Protein; 502 AA
 24-OCT-2001 (first entry)
 2411
1098
433
1094
407
679
679
679
1004
1104
1104
 WO200155182-A1.
 9925.5
9923.5
9922.5
9922.5
9921.5
9921.5
9921.5
9921.5
9931.5
9931.5
9931.5
9931.5
9931.5
9931.5
9931.5
9931.5
9931.5
9931.5
 374
327.5
320
311.5
311.5
279
238
238
 417
 AAU06186;
 Peptide
 Protein
 RESULT 1
 AAU06186
```

25-JAN-2001; 2001WO-AU00069 25-JAN-2000; 2000US-0177917

02-AUG-2001

```
K-----NDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 288
 meningitidis (strains A and B) and nucleic acid sequences (AAX99123-167) encoding the proteins. Compositions comprising the protein, nucleic acid or antibody specific to the protein are useful as pharmaceuticals, e.g. a vaccine composition or a diagnostic composition. The composition is also useful for treating or preventing an infection due to Neisserial bacteria, especially Neisseria meningitidis.
 4 TLKAGDNLKIKO----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 60 AGINGDITVHLNGIGSTLTD------RAASVKDVLNAGWNIKGV
 New protein and its nucleotide sequence, useful in vaccines or diagnostic compositions for treating and/or preventing Neisseria meningitidis infections
 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 The invention provides proteins (AAY27201-245) from Neisseria
 Scarlato V;
 protein; surface glycoprotein; infection; vaccine;
 DB 20;
 Score 957.5; DB 20;
Pred. No. 8.3e-73;
0; Mismatches 0;
 Rappuoli R,
 A surface protein of Neisseria meningitidis.
 ¥.
 Pizza M,
 Peak IRA;
 Claim 1; Page 62; 123pp; English.
 AAY23741 standard; Protein; 591
 94.1%;
85.7%;
 INNOVATION LTD. QUEENSLAND.
 98WO-AU01031
 97GB-0026398
 (first entry)
 Best Local Similarity 85.7
Matches 198; Conservative
 Moxon ER,
 Masignani V,
 Neisseria meningitidis.
 immunoreactive peptide
 1999-444400/37
 (CHIR-) CHIRON SPA.
 591 AA;
 N-PSDB; AAX99124
 WO9931132-A1.
 AIND (DĂA)
 Jennings MP,
 12-DEC-1997;
 14-DEC-1998;
 08-SEP-1999
 24 - JUN - 1999
 Grandi G,
 Sequence
 AAY23741;
 98
 Query Match
 151
 RESULT 3
 AAY2374]
 QQ
 ò
 g
 δy
 셤
 δ
 GTNGDTTVHLNGIGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTT 120
 50 SANTLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETA 109
 VNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVN 180
 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh (AANO6182-AAVO6186). The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence represents N. meningitidis strain PMC21 surface antigen NhhA deletion mutant #4.
 110 GTNGDTTVHLNGIGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTT
 1 SANTLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNLTSDTKGLNFAKETA
 Neisseria meningitidis, useful in producing vaccines for treating or
preventing broad spectrum of Neisseria meningitidis -
 meningitidis protein; pharmaceutical; vaccine; diagnosis;
 ö
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treati
 DB 22; Length 502;
 acid sequence of N. meningitidis protein ORF40-1.
 100.0%; Score 1018; DB 22;
100.0%; Pred. No. 5e-78;
ive 0; Mismatches 0;
 KAGWRMKTTTANGQTGQADKF 201
 AAY27202 standard; Protein; 591
 Claim 12; Fig 9; 91pp; English.
 bacterial infection; treatment.
 99WO-IB00103,
 98GB-0022143.
 98GB-0000760.
 (first entry)
 Conservative
(UYQU) UNIV QUEENSLAND.
 Neisseria meningitidis
 2001-488774/53.
 Jennings
 Local Similarity
nes 201; Conserv
 502 AA;
 N-PSDB; AAS09176.
 24-SEP-1999
 14-JAN-1999;
 09-OCT-1998;
 14-JAN-1998;
01-SEP-1998;
 22-JUL-1999
 Peak IRA,
 Neisseria
 230
 181
 Sequence
 61
 AAY 27 202;
 Query Match
```

Best Loca Matches

δ g ŏ a ò

NAME OF COLOR OF THE PARTY AND 
Amino

AAY27202 RESULT

q

ò 셤

3;

Gaps

33;

Indels

Length 591;

m

ä

33;

```
98 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 AGTNGDTTVHLNGIGSTLTD-------RASVKDVLNAGWNIKGV
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 N. meningitidis PMC21 surface antigen NhhA polypeptide sequence
 Surface antigen NhhA; meningococcal disease; meningitis vaccine.
 /note= "Predicted mature protein, specifically claimed in claim 12"
 Length 591;
 Indels
 94.1%; Score 957.5; DB 20;
85.7%; Pred. No. 8.3e-73;
tive 0; Mismatches 0;
 1..50
/label= C1
/note= "Conserved region 1"
 /label= C3
/note= "Conserved region 3"
 5
 'note= "Variable region 1"
 l..51
/label= Signal_peptide
 Claim 1; Page 127-128; 132pp; English.
 52..591
/label= Mature_NhhA
 Location/Qualifiers
 Neisseria meningitidis strain PMC21
 Ą.
 /label= C2
/note= "Conserved
 /label= V2
/note= "Variable
125..188
 AAU06171 standard; Protein; 591
 (first entry)
 /label= V1
 Conservative
 121..124
 108
 109..120
 meningitidis infections
 Best Local Similarity
 591 AA;
 24-OCT-2001
 Matches 198;
 9
 151
 AAU06171;
 Sequence
 Query Match
 Peptide
 Protein
 Region
 Region
 Region
 Region
 Region
 RESULT 5
 AAU0617
 q
 ö
 g
 ò
 ρp
 à
 g
 NO NE PET TE PET
 э;
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 97
 ------RAASVKDVLNAGWNIKGV
 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to leaved to identify immunoreactive peptides.
 Neisseria meningitidis surface proteins useful for treating N. meningitidis infections
 Length 591;
 Neisseria meningitidis surface proteins useful for treating N.
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 Surface protein; surface glycoprotein; infection; vaccine;
 DB 20;
 Score 957.5; DB 20;
Pred. No. 8.3e-73;
 A surface protein of Neisseria meningitidis.
 0; Mismatches
 AGTNGDTTVHLNGIGSTLTD------
 Claim 1; Page 104-106; 132pp; English
 591 AA
 Peak IRA;
 94.1%;
 AAY23746 standard; Protein;
 (ISIS-) ISIS INNOVATION LTD. (UYQU) UNIV QUEENSLAND.
 98WO-AU01031
 97GB-0026398
 (first entry)
 Local Similarity 85.7 tes 198; Conservative
 Jennings MP, Moxon ER,
 immunoreactive peptide.
 Neisseria meningitidis
WPI; 1999-418754/35.
N-PSDB; AAX85793.
 WPI; 1999-418754/35
 591 AA;
 N-PSDB; AAX85798
 08-SEP-1999
 WO9931132-A1
 14-DEC-1998;
 12-DEC-1997;
 24-JUN-1999
 Sequence
 9
 169
 229
 AAY23746;
 Query Match
 tches
 AAY23746
 RESULT
 g
 g
 ò
 ò
 셤
 ò
 g
 à
```

```
AAU06175 standard; Protein; 591 AA.
 Peak IRA,
 AAU06175;
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 Region
AAU06175
 3;
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 97
 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhA (AAMU06182-AAMU06186). The modified or mutant NhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than vould be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain PWC21 is 1 of 10 NhhA polypeptide sequences the contract of 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 ------RAASVKDVLNAGWNIKGV
 Gaps
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
 33;
 Length 591;
 Indels
 DB 22;
 Score 957.5; DB 22;
Pred. No. 8.3e-73;
 /label= C4
/note= "Conserved region 4"
 237.591
| Abbel = C5
| Note= "Conserved region 5"
 /label= V4
/note= "Variable region 4"
 0; Mismatches
 /label= V3
/note= "Variable region 3"
 AGTNGDTTVHLNGIGSTLTD-----
 Claim 9; Fig 1; 91pp; English.
 94.18;
85.78;
 25-JAN-2001; 2001WO-AU00069.
 25-JAN-2000; 2000US-0177917
 .229
 .236
 Conservative
 (UYQU) UNIV QUEENSLAND
 Peak IRA, Jennings MP;
 the present invention.
 2001-488774/53.
 Local Similarity
nes 198; Conserv
 591 AA;
 WPI; 2001-488774/:
N-PSDB; AAS09161.
 WO200155182-A1.
 02-AUG-2001
 Sequence
 9
 86
 229
 151
 Query Match
 Region
 Region
 Region
 Region
 Matches
```

```
The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigon Nhh annoingitidis mutant polypeptides of the surface antigon Nhh Adv06182-AAV06186). The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen.
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
 N. meningitidis EG329 surface antigen NhhA polypeptide sequence.
 Surface antigen NhhA; meningococcal disease; meningitis vaccine.
 "Conserved region 2"
 "Conserved region 1"
 "Conserved region 3"
 /note= "Conserved region 5"
 /label= V1
/note= "Variable region 1"
 /label= V3
/note= "Variable region 3"
 /label= V4
/note= "Variable region 4"
 "Variable region 2"
 "Conserved region
 Neisseria meningitidis strain EG329
 Location/Qualifiers
 Claim 9; Fig 1; 91pp; English
 25-JAN-2001; 2001WO-AU00069
 25-JAN-2000; 2000US-0177917
 /label= C2
 /label= v2
 C3
 /label= C4
 /label= C5
 /label= Cl
 125..188
/label= C
 120
 124
 210
 . 236
 .591
 211..229
 51..108
 (UYQU) UNIV QUEENSLAND.
 Jennings MP;
 /note=
 /note-
 /note=
 /note=
 2001-488774/53.
 N-PSDB; AAS09165.
 WO200155182-A1
24-OCT-2001
```

g

à

a

ò g οy

ö

Ŋ

```
24-JUN-1999
 AAY23737;
 Sequence
 RESULT 8
 AAY2373'
 ŏ
 q
 ò
 a
 ŏ
 q
 ά
 3;
 168
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 59
 97
The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain EG329 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
 BASB029; Nisseria meningitidis; surface fibril protein; HSF; diagnosis; infection; treatment; prevent; antibacterial drug.
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 ---RAASVKDVLNAGWNIKGV
 Gaps
 33;
 BASB029 amino acid sequence from N. meningitidis strain H44/76.
 Length 591;
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 Indels
 DB 22;
 94.1%; Score 957.5; DB 22;
85.7%; Pred. No. 8.3e-73;
ive 0; Mismatches 0;
 "Encoded by AATC'
 "Encoded by GAT"
 'note= "Encoded by AAC"
 "Encoded by AAA"
 /note= "Encoded by CGT"
 /note= "Encoded by AAT"
 SMIK) SMITHKLINE BEECHAM BIOLOGICALS.
 .
Misc-difference 90
 'note= "Encoded by
 AAY57045 standard; Protein; 591 AA
 AGTNGDTTVHLNGIGSTLTD
 99WO-EP03255
 (first entry)
 al Similarity 85.7
198; Conservative
 /note= "
98
 /note=
Misc-difference 123
 /note=
 the present invention.
 Neisseria meningitidis
 WPI; 2000-053103/04.
N-PSDB; AAZ39865.
 Misc-difference 108
 Misc-difference 92
 591 AA;
 Misc-difference
 Misc-difference
 Misc-difference
 W09958683-A2
 07-MAY-1999;
 13-MAY-1998;
 21-FEB-2000
 18-NOV-1999
 Ruelle J;
 Sequence
 09
 AAY57045;
 86
 Query Match
 Local
 Best Loc
Matches
 AAY57045
 RESULT
8888888
 ò
 g
 셤
 à
 셤
 g
 õ
```

```
This is the Nisseria meningitidis BASBO29 amino acid sequence from serogroup B strain H44/76. The BASBO29 protein is homologous to the taemophilus influenzea surface fibril (HSF) protein. The invention relates to BASBO29 polynucleotide sequences (AAX23864-Z38865) and collapseptide sequences (AAX2364-Y27045) and their immunogenic fragments. BASBO29 polypeptides are useful in a method of diagnosing a Neisseria meningitidis infection in a mammal. Compositions containing BASBO29 polynucleotides and polypeptides are useful for generating an immune response in an animal. A therapeutic composition comprising an antibody directed against BASBO29 is useful in treating humans with Neisseria meningitidis disease. The polynucleotide is useful in the diagnosis of the stage of infection, type of infection, susceptibility to an infection which results from increased or decreased expression of the polynucleotide, and for therapeutic or prophylactic purposes, particularly genetic immunisation. Antibodies against BASBO29 particularly bacterial infections. The protein is useful in the secenting and development of antibacterial drugs. Fused recombinant screening and development of antibacterial drugs. Fused recombinant protein is useful for the stimulation of the immune system of an organism
 168
 228
 229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL 288
 98 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 59
 97
 -----RAASVKDVLNAGWNIKGV
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
New polypeptide from neisseria meningitidis useful for diagnosis, treatment or prevention of bacterial infections in mammal
 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 Length 591;
 Surface protein; surface glycoprotein; infection; vaccine;
 Indels
 DB 21;
 Score 954.5; DB 21;
Pred. No. 1.5e-72;
1; Mismatches 0;
 60 AGTNGDTTVHLNGIGSTLTD------
 A surface protein of Neisseria meningitidis.
 Ā
 Query Match 93.8%; Sc
Best Local Similarity 85.3%; Pr
Matches 197; Conservative 1;
 AAY23737 standard; Protein; 592
 Claim 4; Fig 2; 74pp; English.
 98WO-AU01031
 97GB-0026398
 08-SEP-1999 (first entry)
 immunoreactive peptide.
 Neisseria meningitidis
 receiving the protein.
 591 AA;
 WO9931132-A1
 14-DEC-1998;
 12-DEC-1997;
```

```
139 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 198
 -----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT 47
 DVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA
 223 DVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGA
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to ldentify immunoreactive peptides.
 Surface antigen NhhA; meningococcal disease; meningitis vaccine.
 N. meningitidis BZ10 surface antigen NhhA polypeptide sequence.
 DB 20; Length 598;
 Neisseria meningitidis surface proteins useful for treating
 Indels
 . 4.3e-70;
 1..50
/label= C1
/note= "Conserved region 1"
 /label= C2
/note= "Conserved region 2"
 1; Mismatches
 -
 90.9%; Score 925.5; 79.8%; Pred. No. 4.3
 /note-
51..104
/labela Vl
...e= "Variable region 1'
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD-
 Claim 1; Page 91-93; 132pp; English.
 location/Qualifiers
 AA.
 AAU06178 standard; Protein; 598
 Neisseria meningitidis strain
 2 ANTLKAGDNLKIKQ----
 (first entry)
 Local Similarity 79.8
hes 194; Conservative
 meningitidis infections
 WPI; 1999-418754/35.
N-PSDB; AAX85790.
 598 AA;
 343 DKF 345
 DKF 201
 24-OCT-2001
 Sequence
 AAU06178;
 Query Match
 98
 199
 Region
 Region
 Region
 Region
 Matches
 RESULT 10
 AAU06178
 g
 δ
 q
 ò
 QQ
 ò
 g
 ò
 g
 3,
 98 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 59
 6
 60 AGTNGDTTVHLNGIGSTLTD-------RAASVKDVLNAGWNIKGV
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 Gaps
 meningitidis which is approximately 62 kba. The N. meningitidis surface dlycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 33;
 The present sequence represents a surface protein of Neiserria
 ż
 Length 592;
 Neisseria meningitidis surface proteins useful for treating meningitidis infections
 Surface protein; surface glycoprotein; infection; vaccine;
 Score 953.5; DB 20; Length
Pred. No. 1.8e-72;
0; Mismatches 1; Indels
 surface protein of Neisseria meningitidis.
 Claim 1; Page 86-87; 132pp; English
 Æ
 Moxon ER, Peak IRA;
 Peak IRA;
 AAY23738 standard; Protein; 598
 93.7%;
85.3%;
 INNOVATION LTD
 INNOVATION LTD
 98WO-AU01031
 97GB-0026398
 (first entry)
 Local Similarity 85.3 les 197; Conservative
(ISIS-) ISIS INNOVATION (UYQU) UNIV QUEENSLAND
 Moxon ER,
 QUEENSLAND
 immunoreactive peptide
 Neisseria meningitidis
 WPI; 1999-418754/35
N-PSDB; AAX85788.
 592 AA;
 08-SEP-1999
 AINO (DŌXO)
 Jennings MP,
 Jennings MP,
 WO9931132-A1
 14-DEC-1998;
 2-DEC-1997;
 24-JUN-1999
 Sequence
 AAY23738;
 Query Match
 Matches
 AAY23738
 RESULT
 g
 g
 ò
 ŏ
 ò
 a
 ò
 셤
```

282

138

82

ä

43;

humans

ż

```
286 SVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 345
 LNAGWNIKGVK - - - - - - NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 -----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 Indels 43; Gaps
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or attibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
 Score 925.5; DB 20; Length 599;
Pred. No. 4.3e-70;
L; Mismatches 4; Indels 43;
 ż
 Neisseria meningitidis surface proteins useful for treating meningitidis infections
 Surface protein; surface glycoprotein; infection; vaccine;
 4
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD------
 A surface protein of Neisseria meningitidis.
 Claim 1; Page 114-115; 132pp; English.
 AAY23743 standard; Protein; 599 AA.
 Peak IRA;
 1;
 90.9%;
80.1%;
 98WO-AU01031
 (ISIS-) ISIS INNOVATION LTD. (UYQU) UNIV QUEENSLAND.
 97GB-0026398
 08-SEP-1999 (first entry)
 4 TLKAGDNLKIKQ----
 Query Match 90.9
Best Local Similarity 80.1
Matches 193; Conservative
 Moxon ER,
 Veisseria meningitidis.
 immunoreactive peptide
 WPI; 1999-418754/35.
N-PSDB; AAX85795.
 599 AA;
 199 DKF 201
 343 DKF 345
 Jennings MP,
 W09931132-A1
 14-DEC-1998;
 .2-DEC-1997;
 24-JUN-1999.
 AAY23743;
 Sequence
 141
 RESULT 11
 AAY23743
 g
 g
 g
 5
 ò
 qq
 ò
 qq
 ά
 à
 3;
 283 KTSVIKEKDĞKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 342
 DVLNAGWNIKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA 138
 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 198
 ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT 47
 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD------RAASVK 85
 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen Nhh AAMU06186. The modified or mutant Nhh polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain B210 is 1 of 10 Nhh polypeptide sequences (AAU06111-AAU06180) from 10 different N. meningitidis strains given in
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
 43; Gaps
 Length 598;
 Score 925.5; DB 22; Length
Pred. No. 4.3e-70;
1; Mismatches 5; Indels
131..194
/label= C3
/note= "Conserved region 3"
 //abel= C4
/note= "Conserved region 4"
 /note= "Conserved region 5"
 /note= "variable region 4"
243.598
/label= C5
 /label= V3
/note= "Variable region 3"
 Claim 9; Fig 1; 91pp; English
 90.9%;
 25-JAN-2001; 2001WO-AU00069
 25-JAN-2000; 2000US-0177917
 /label= V4
 ANTLKAGDNLKIKQ---
 Query Match
Best Local Similarity 79.89
Watches 194; Conservative
 .216
 .235
 . 242
 (UYQU) UNIV QUEENSLAND.
 Jennings MP;
 the present invention.
 WPI; 2001-488774/53.
 598 AA;
 N-PSDB; AAS09168
 WO200155182-A1
 02-AUG-2001
 Peak IRA,
 Sequence
 48
 163
 98
 233
 139
 Region
 Region
 Region
 Region
 Region
```

ä

165

q

ò

셤 ò g ò

ŏ

87

49

140 225

œ

ë,

49

```
characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen Nhha from N. meningitidis strain H38 is 1 of 10 Nhha polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains in
 -----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 --RAASVKDV
 166 TKGLNFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDKKKRAASVKDV
 LNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 43;
 ż
 Length 599;
 Neisseria meningitidis surface proteins useful for treating meningitidis infections
 Surface protein; surface glycoprotein; infection; vaccine;
 Indels
 DB 22;
 Score 925.5; DB 2
Pred. No. 4.3e-70;
1; Mismatches 4
 A surface protein of Neisseria meningitidis.
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD-
 AAY23739 standard; Protein; 594 AA
 Peak
 96.06
 80.18;
 98WO-AU01031
 97GB-0026398.
 INNOVATION LTD.
 (first entry)
 4 TLKAGDNLKIKQ----
 Conservative
 (ISIS-) ISIS INNOVATION (UYQU) UNIV QUEENSLAND.
 Moxon ER,
 immunoreactive peptide
 Neisseria meningitidis
 the present invention
 Best Local Similarity
Matches 193; Conserve
 WPI; 1999-418754/35
 599 AA;
 N-PSDB; AAX85791
 F 346
 F 201
 WO9931132-A1.
 14-DEC-1998;
 Jennings MP,
 12-DEC-1997;
 08-SEP-1999
 24-JUN-1999
 Sequence
 346
 AAY23739;
 88
 141
 Query Match
 201
 RESULT 13
 AAY 23739
 g
 222222222222%8
 g
 οy
 q
 ŏ
 QQ
 QΣ
 δy
 g
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhhA (AAU06182-AAU06186). The modified or mutant NhhA polypeptides are
 Surface antigen NhhA; meningococcal disease; meningitis vaccine
 N. meningitidis H38 surface antigen NhhA polypeptide sequence.
 32..195
|abel= C3
note= "Conserved region 3"
 244.599
/label= C5
/note= "Conserved region 5"
 label= C2
note= "Conserved region 2"
 "Conserved region 1"
 "Conserved region 4"
 4
 1
 3
 2
 /note-
196..217
/label= V3
-~= "Variable region 3'
 51..105
/label= V1
/note= "Variable region
 "Variable region
 137..243
|Tabel= V4
|note= "Variable region
 Location/Qualifiers
 AAU06176 standard; Protein; 599 AA.
 Neisseria meningitidis strain H38
 Claim 9; Fig 1; 91pp; English.
 25-JAN-2001; 2001WO-AU00069
 25-JAN-2000; 2000US-0177917
 .18..131
'label= V2
 24-OCT-2001 (first entry)
 1..50
/label= C1
 06..117
 (UYQU) UNIV QUEENSLAND
 note=
 Peak IRA, Jennings MP;
 note=
 'note=
 note=
 WPI; 2001-488774/53.
N-PSDB; AAS09166.
 F 346
 WO200155182-A1
 F 201
 02-AUG-2001
 346
 AAU06176;
 201
 Key
Region
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 RESULT 12
 AAU06176
 g
 ò
```

345

225

```
A surface protein of Neisseria meningitidis.
 02-AUG-2001
 Sequence
 AAY23740;
 Query Match
 Region
 Matches
 RESULT 15
 AAY23740
 g
 ð
 g
 q
 à
 DXIX
 ŏ
 90 AGWNIKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 142 | 111111111 | 1111111 | 1111111 | 1123 AGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 282
 ---RAASVKDVLN 89
 2 ANTLKAGDNLKIKQ -----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK
 Gaps
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kDa. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
 N. meningitidis BZ198 surface antigen NhhA polypeptide sequence.
 Surface antigen NhhA; meningococcal disease; meningitis vaccine.
 39;
 Query Match

90.7%; Score 923.5; DB 20; Length 594;
Best Local Similarity 81.2%; Pred. No. 6.3e-70;
Matches 194; Conservative 0; Mismatches 6; Indels 39;
 /note-
127..190
/label- C3
_-to= "Conserved region 3"
 /label= C4
/note= "Conserved region 4"
 "Conserved region 1"
 /label= C2
/note= "Conserved region 2"
 3
 'note= "Variable region
 /label= v3
/note= "Variable region
 GLNFAKETAGTNGDTTVHLNGIGSTLTD
Claim 1; Page 95-97; 132pp; English.
 Weisseria meningitidis strain BZ198
 Location/Qualifiers
 AAU06179 standard; Protein; 594 AA.
 51..104
/label= V1
/note= "Variable
 1..50
/label= C1
 232..238
/label= V4
 'label= V2
 24-OCT-2001 (first entry)
 ..126
 105..116
 113..231
 'note=
 594 AA;
 Seguence
 52
 AAU06179;
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 Region
 RESULT 14
 AAU06179
 g
 셤
 a
 ò
 à
 ò
 ò
 셤
```

```
AGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 142
 ----- RAASVKDVLN 89
 The present invention relates to the isolation of novel Neisseria meningitidis mutant polypeptides of the surface antigen NhA (AAU06182-AAU06186). The modified or mutant NhA polypeptides are characterised by deletions of non-conserved amino acids, particularly the deletion of variable regions. The deletion mutants are useful in diagnostics, therapeutic and prophylactic vaccines against a broader spectrum of N. meningitidis, and in designing and/or screening of medicaments. The mutant proteins when used as a vaccine can effectively immunise against a broader spectrum of N. meningitidis strains than would be expected from a corresponding wild-type surface antigen. The present sequence representing the wild type surface antigen NhhA from N. meningitidis strain B2198 is 1 of 10 NhhA polypeptide sequences (AAU06171-AAU06180) from 10 different N. meningitidis strains given in
 2 ANTLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK
 New NhhA surface antigen polypeptides and polynucleotides from Neisseria meningitidis, useful in producing vaccines for treating or preventing broad spectrum of Neisseria meningitidis -
 DB 22; Length 594;
 90.7%; Score 923.5; DB 22;
81.2%; Pred. No. 6.3e-70;
iive 0; Mismatches 6;
 ŝ
 52 GLNFAKETAGTNGDTTVHLNGIGSTLTD-----
'note= "Variable region 4"
 239..594
/label= C5
/note= "Conserved"
 Protein; 594
 Claim 9; Fig 1; 91pp; English.
 25-JAN-2000; 2000US-0177917.
 25-JAN-2001; 2001WO-AU00069
 (first entry)
 Local Similarity 81.7 hes 194; Conservative
 (UYQU) UNIV QUEENSLAND
 Peak IRA, Jennings MP;
 the present invention.
 WPI; 2001-488774/53
 AAY23740 standard;
 594 AA;
 N-PSDB; AAS09169
 WO200155182-A1.
 08-SEP-1999
```

3;

```
3;
 105 TLKAGDNLKIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGL 164
 92 WNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 4 TLKAGDNLKIKQ-----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL 53
 54 NFAKETAGTNGDTTVHLNGIGSTLTD-------RAASVKDVLNAG 91
 285 EKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKF 341
 145 EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 Query Match 90.6%; Score 922.5; DB 20; Length 594; Best Local Similarity 81.0%; Pred. No. 7.7e-70; Matches 192; Conservative 3; Mismatches 3; Indels 39; Gaps
 The present sequence represents a surface protein of Neiserria meningitidis which is approximately 62 kba. The N. meningitidis surface glycoproteins, nucleic acids, the primers and optionally a thermostable polymerase, or antibodies are useful in a kit for the detection or diagnosis of N. meningitidis infection in humans. The N. meningitidis surface glycoproteins can also be used to prevent or treat N. meningitidis infection in humans, especially in the form of vaccines. The proteins and antibodies can also be used to identify immunoreactive peptides.
 Neisseria meningitidis surface proteins useful for treating N. meningitidis infections
 Surface protein; surface glycoprotein; infection; vaccine;
 Claim 1; Page 100-101; 132pp; English.
 Peak IRA;
 98WO-AU01031.
 (ISIS-) ISIS INNOVATION LTD. (UYQU) UNIV QUEENSLAND.
 97GB-0026398
 Jennings MP, Moxon ER,
 immunoreactive peptide
 Neisseria meningitidis
 WPI; 1999-418754/35.
 594 AA;
 N-PSDB; AAX85792
 14-DEC-1998;
 12-DEC-1997;
 W09931132-A1
 24-JUN-1999.
 Sequence
g
 g
 ò
 g
 δ
 ŏ
 ð
```

6, 2003, 09:22:46 Search completed: October Job time : 18.261 secs

\_

```
RESULT 2
 qq
 οp
 qq
 g
 δ
 ÓΣ
 ŏ
 οy
 11, Appl
21, Appl
2, Appli
5, Appli
5, Appli
15, Appli
7, Appli
9, Appli
9, Appli
 Appl
Appl
 Appli
Appli
Appli
 Appl
Appl
Appl
Appl
 (without alignments)
1582.188 Million cell updates/sec
 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
 time 5.37514 Seconds
 ດິດ
 Description
 sedineurce
 1 SANTLKAGDNLKIKQFTYSL.....AGWRMKTTTANGQTGQADKF
 1: /cgg_2_6/ptodata/1/iaa/5A_COMB.pep:*
2: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*
3: /cgn2_6/ptodata/1/iaa/6A_COMB.pep:*
4: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
5: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*
6: /cgn2_6/ptodata/1/iaa/pcTuS_COMB.pep:*
5.1.6
Compugen Ltd
 6, 2003, 09:14:45; Search
 US-09-377-155-21
US-09-669-974-11
US-09-669-974-21
US-09-377-155-2
US-09-679-17-155-5
US-09-679-17-155-5
US-09-679-17-155-15
US-09-679-17-155-15
US-09-689-974-15
US-09-689-974-15
US-09-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
US-08-689-974-19
 Total number of hits satisfying chosen parameters:
 328717 seqs, 42310858 residues
 SUMMARIES
 GenCore version
Copyright (c) 1993 - 2003
 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
 protein search, using sw model
 Gapop 10.0 , Gapext 0.5
 Issued_Patents_AA:*
 seq length: 0
seq length: 200000000
 US-09-771-382-39
1018
 Length
 BLOSUM62
 October
 Query
 957.5
957.5
957.5
953.5
953.5
953.5
953.5
953.5
953.5
953.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
972.5
 Title:
Perfect score:
 Scoring table:
 OM protein
 Minimum DB
Maximum DB
 Sequence:
 Searched:
 Database
 Run on:
 Result
No.
```

```
'n
 228
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
 59
 97
 4 TLKAGDNEKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 60 AGTNGDTTVHLNGIGSTLTD-------RAASVKDVLNAGWNIKGV
 Gaps
 Sequence 2, A Sequence 32, Sequence 4, A Sequence 4, A Sequence 4, A Sequence 6, A Sequence 6, A Sequence 6, A Sequence 15, Sequence 15, Sequence 26, Sequence 26
 Sequence Sequence Sequence
 Sequence
 Indels 33;
 Length 591;
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 Score 957.5; DB 3;
Pred. No. 2.4e-84;
0; Mismatches 0;
US-08-409-995-2
US-08-685-467-2
US-08-913-945-3-3
US-08-913-945-2
US-09-669-974-32
US-09-68-347-44
US-08-685-467-4
US-08-685-467-4
US-09-28-347-32
US-09-268-347-25
US-09-268-347-26
 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: WOXON, E Richard Paul APPLICANT: WOXON, E Richard FILE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 055064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: CTANU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER: OF SEQ ID NOS: 33
SCOTTWARE: PATENTIN Ver. 2.0
 ALIGNMENTS
 Sequence 11, Application US/09377155
Patent No. 6197312
GENERAL INFORMATION:
 US-09-377-155-21
; Sequence 21, Application US/09377155
Patent No. 6197312
; GENERAL INFORMATION:
 ; ORGANISM: Neisseria meningitidis US-09-377-155-11
 94.18;
 Query Match
Best Local Similarity 85.7%
Matches 198; Conservative
 10098
10098
10098
10098
10098
1012
23354
607
607
607
10094
679
10004
 US-09-377-155-11
 LENGTH: 591
TYPE: PRT
 618
618
618
618
618
616
618
616.5
605.5
605.5
605.7
417
417
417
417
327.5
 86
```

2

```
229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 288
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 109 TLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET 168
 98 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 -- RAASVKDVLNAGWNIKGV
 4 TLKAGDNLKIKO----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 60 AGINGDTIVHLNGIGSTLTD-------RAASVKDVLNAGWNIKGV
 Gaps
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 33;
 Query Match 94.1%; Score 957.5; DB 4; Length 591; Best Local Similarity 85.7%; Pred. No. 2.4e-84; Matches 198; Conservative 0; Mismatches 0; Indels 33
 GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENINIOS, Michael Paul
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR PRILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-12
 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
 Sequence 21, Application US/09669974 Patent No. 6333173
 ; Sequence 2, Application US/09377155; Patent No. 6197312; GENERAL INFORMATION:
 ; ORGANISM: Neisseria meningitidis
US-09-669-974-21
 60 AGTNGDTTVHLNGIGSTLTD
 Patentin Ver. 2.0
 SOFTWARE: Pate
SEQ ID NO 21
LENGTH: 591
 US-09-669-974-21
 US-09-377-155-2
 86
 TYPE: PRT
 g
 ò
 g
 οy
 q
 g
 g
 ò
 δ
 δ
 δy
 228
 109 TLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET 168
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 29
 59
 6
 ------RAASVKDVLNAGWNIKGV
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 Indels 33; Gaps
 Gaps
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTŢTANGQTGQADKF 201
 33;
 94.1%; Score 957.5; DB 3; Length 591;
85.7%; Pred. No. 2.4e-84;
Live 0; Mismatches 0; Indels 33
 Length 591;
 Indels
 Score 957.5; DB 4;
Pred. No. 2.4e-84;
0; Mismatches 0;
 GREBRAL INCORDATION:
APPLICANT: PRAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
ITILE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US 09/377,155
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1998-108-19
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
 ON: NOVEL SURFACE ANTIGEN 065064/0128
 FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
 AGTNGDTTVHLNGIGSTLTD-----
 PEAK, Ian Richard Anselm
JENNINGS, Michael Paul
MOXON, E. Richard
 Sequence 11, Application US/09669974 Patent No. 6333173
 ; ORGANISM: Neisseria meningitidis US-09-377-155-21
 ; ORGANISM: Neisseria meningitidis US-09-669-974-11
 94.18;
85.78;
 Patentin Ver. 2.0
 NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
 Query Match 94.18
Best Local Similarity 85.73
Matches 198; Conservative
 Query Match
Best Local Similarity 85.7
Matches 198; Conservative
 NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2
SEQ ID NO 21
APPLICANT: PEAK, IAN APPLICANT: JENNINGS, APPLICANT: MOXON, E. TITLE OF INVENTION: 1
 US-09-669-974-11
 LENGIH: 591
 SEQ ID NO 11
LENGTH: 591
 9
 86
 TYPE: PRT
 g
 g
 ŏ
 q
 δ
 셤
 ò
 ŏ
 δy
 Ω
```

'n

29

m

```
Sequence 5, Application US/09377155
Patent No. 6197312
 Sequence 5, Application US/09669974 Patent No. 6333173
 ; ORGANISM: Neisseria meningitidis US-09-377-155-5
 90.9%;
 Query Match 90.9
Best Local Similarity 79.8
Matches 194; Conservative
 GENERAL INFORMATION:
 GENERAL INFORMATION:
 111
343 DKF 345
 199 DKF 201
 598
 US-09-669-974-5
 SEQ ID NO 5
 98
 RESULT 8
 Óλ
 a
 d
 δ
 g
 ŏ
 g
 δλ
 g
 ò
 g
 3
 98 K------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 K-----NVDFVRTYDTVEFLSADÍKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 110 TLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET 169
 130 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKL 289
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET 59
 -----RAASVKDVLNAGWNIKGV 97
 4 TLKAGDNLKIKO----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 Gaps
 Gaps
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 33;
 Score 953.5; DB 3; Length 592;
Pred. No. 5.8e-84;
0; Mismatches 1; Indels 33
 Length 592;
 Indels
 DB 4;
 Score 953.5; DB 4 Pred. No. 5.8e-84;
 60 AGTNGDTTVHLNGIGSTLTD------
 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: PEAK, Ian Richard Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: WOXON, E. Richard G. CURRENT APPLICATION NUMBER: US/09/669,974 CURRENT FILING DATE: 1999-08-19 PRIOR APPLICATION NUMBER: US 09/377,155 PRIOR APPLICATION NUMBER: US 09/377,155 PRIOR APPLICATION NUMBER: PCT/AU98/01031 PRIOR APPLICATION NUMBER: GB 9726398.2 PRIOR FILING DATE: 1998-12-14 PRIOR FILING DATE: 1997-12-12 NUMBER OF SEQ ID NOS: 33 SOFTWARE: PATCHING DATE: 1997-12-12
 0; Mismatches
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
 IMBER: GB 9726398.2
1997-12-12
 Sequence 2, Application US/09669974 Patent No. 6333173 GENERAL INFORMATION:
 ORGANISM: Neisseria meningitidis
 ORGANISM: Neisseria meningitidis
 PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: Patentin Ver. 2.0
SEQ ID NO 2
LENGTH: 592
 93.7%;
85.3%;
 Query Match 93.7%;
Best Local Similarity 85.3%;
Matches 197; Conservative
 Best Local Similarity 85.3
Matches 197; Conservative
 SEQ ID NO.2
 US-09-377-155-2
 US-09-669-974-2
 170
 TYPE: PRT
 Query Match
Best Local 2
 86
 셤
 ò
 셤
 δ
 g
 ò
 g
 셤
 ò
 g
 ò
 ð
 ò
```

```
ë
 138
 282
 230 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKL 289
 162
 47
 85
 2 ANTLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD--------RAASVK
 DVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA
 43;
 Length 598;
 Indels
 DB 3;
 Score 925.5; DB Pred. No. 3e-81;
 APPLICANT: JENRINGS, MICHAEL ANSELM APPLICANT: JENNINGS, MICHAEL PAUL APPLICANT: MONON, E. RICHAEL APPLICANT: MONON, E. RICHAEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1997-12-12
RIOR FILING DATE: 1997-12-12
RIOR FILING NOS: 33
SOFTWARE: PATENTIN VET. 2.0
 Mismatches
 APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
```

```
88 LNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT 140
 141 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 200
 286 SVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 345
 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD-------RAASVKDV
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 Length 599;
 Indels
 DB 4;
 Query Match 90.9%; Score 925.5; DB Best Local Similarity 80.1%; Pred. No. 3e-81; Matches 193; Conservative 1; Mismatches
 APPLICANT: PEAK, Tan Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard TTTLE OF INVENTION: NOVEL SUFFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: US 09/377,155
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-16-14
PRIOR FILING DATE: 1999-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
 GENERAL INFORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: DENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
 ; Sequence 15, Application US/09669974
; Patent No. 6333173
 ; Sequence 7, Application US/09377155
; Patent No. 6197312
 ; ORGANISM: Neisseria meningitidis
US-09-669-974-15
 NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
SEQ ID NO 15
 ; GENERAL INFORMATION:
 |
F 346
 201 F 201
 346 F 346
 201 F 201
 US-09-669-974-15
 RESULT 11
US-09-377-155-7
 346
 141
 LENGTH
 g
 g
 οy
 òγ
 g
 ò
 g
 ò
 qq
 ğ
 86 DVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA 138
 282
 139 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 198
 88 LNAGWNIKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT 140
 47
 -----RAASVK 85
 -----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD 49
 ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT
 Gaps
 Gaps
 43;
 43;
 Length 598;
 Score 925.5; DB 3; Length 599;
Pred. No. 3e-81;
1; Mismatches 4; Indels 43
 Indels
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD------
 Score 925.5; DB 4;
Pred. No. 3e-81;
; Mismatches 5;
 DB 4;
 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SCOTWARRE: Patentin Ver. 2.0
 Sequence 15, Application US/09377155 Patent No. 6197312
 ; ORGANISM: Neisseria meningitidis US-09-669-974-5
 1;
 ORCANISM: Neisseria meningitidis US-09-377-155-15
 90.98;
 Query Match

Best Local Similarity 80.1%;
Matches 193; Conservative 1
 2 ANTLKAGDNLKIKQ----
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver. 2.0
 4 TLKAGDNLKIKQ----
 Matches 194; Conservative
 Similarity
 ; GENERAL INFORMATION:
 343 DKF 345
 199 DKF 201
 US-09-377-155-15
 LENGTH: 598
 TYPE: PRT
 Query Match
Best Local S
 SEQ ID NO 5
 TYPE: PRT
 g
 δ
 ð
 q
 ŏ
 g
 8
 à
 g
 à
 g
 ò
 ò
 à
 g
```

165

87

49

S

```
23 AGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 282
 105 TLKAGDNLKIKQNTNENTNASSFTYSLKKDLTDLTSVGTEKLSFSANSNKVNITSDTKGL 164
 WNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL 53
 54 NFAKETAGTNGDTTVHLNGIGSTLTD-------RAASVKDVLNAG 91
 145 EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 285 EKDGKLVTGKDKGENDSSTDKGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 341
 143 IKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 Indels 39;
 Length 594;
 Score 922.5; DB 3;
Pred. No. 5.8e-81;
3; Mismatches 3;
 APPLICANT: PEAK, Ian Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul TITLE OF INVENTION: RICHARD TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1998-12-14
PRIOR FILING DATE: 1998-12-12
NUMBER OF SEQ ID NOS: 33
SEQ ID NO 9
 GENERAL INCORMATION:
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: PEAK, Ian Richard Anselm
APPLICANT: JENNINGS, Michael Paul
APPLICANT: MOXON, E. Richard
TITLE OF INVENTION: NOVEL SURFACE ANTIGEN
FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 1999-08-19
PRIOR APPLICATION NUMBER: PCT/AU98/01031
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1997-12-14
SOFTWARE: PATENTING OFFE: 1997-12-12
 ; Sequence 9, Application US/09377155
; Patent No. 6197312
 Sequence 9, Application US/09669974 Patent No. 6333173
 ; ORGANISM: Neisseria meningitidis
US-09-377-155-9
 90.6%;
81.0%;
 Matches 192; Conservative
 Query Match
Best Local Similarity
 GENERAL INFORMATION:
 US-09-669-974-9
 PRT
 92
 SEQ ID NO 9
 g
 ö
 QQ
 g
 ò
 g
 ò
 g
 δ
 90 AGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 142
 AGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 142
 ----RAASVKDVLN 89
 52 GLNFAKETAGTNGDTTVHLNGIGSTLTD--------RAASVKDVLN 89
 143 IKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 283 IKEKDGKLVTGKGKDENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 341
 2 ANTLKAGDNLKIKQ-----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK
 2 ANTLKAGDNLKIKQ-----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK
 Gaps
 Gaps
 39;
 39;
 Length 594;
 Length 594;
 Indels
 Indels
 Score 923.5; DB 4;
Pred. No. 4.6e-81;
----hes 6;
 Query Match 90.7%; Score 923.5; DB 3; Best Local Similarity 81.2%; Pred. No. 4.6e-81; Matches 194; Conservative 0; Mismatches 6;
 CHERCANT: DEDAK, IAN Richard Anselm APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DENNINGS, Michael Paul APPLICANT: DWOND, E. Richard FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/669,974
CURRENT FILING DATE: 2000-09-26
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-19
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-08-12
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1999-12-14
SOFTWARE: PALENTIN VET. 2.0
 GLNFAKETAGINGDITVHLNGIGSTLTD----
 PCT/AU98/01031
PRIOR APPLICATION NUMBER: PCT/AU98/0103
PRIOR FILING DATE: 1998-12-14
PRIOR APPLICATION NUMBER: GB 9726398.2
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ IN ONS: 33
 Sequence 7, Application US/09669974
Patent No. 6333173
 ; ORGANISM: Neisseria meningitidis US-09-377-155-7
 ORGANISM: Neisseria meningitidis
 90.7%;
 PatentIn Ver. 2.0
 Best Local Similarity 81.2
Matches 194; Conservative
 GENERAL INFORMATION:
 594
 US-09-669-974-7
 US-09-669-974-7
 SOFTWARE:
SEQ ID NO 7
 TYPE: PRT
 52
 90
 Query Match
 SEQ ID NO 7
 g
 δ
 a
 ò
 셤
 õ
 qq
 g
 ò
 g
 δ
 õ
 ò
```

Gaps

```
223 DVLNAGWNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA 282
 225 WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIK 284
 DVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGA 138
 139 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 198
 WNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL 53
 ---RAASVKDVLNAG 91
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD-------RAASVK 85
 2 ANTLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT
 Gaps
 Indels 43; Gaps
 90.6%; Score 922.5; DB 4; Length 594;
81.0%; Pred. No. 5.8e-81;
live 3; Mismatches 3; Indels 39;
 Length 598;
 Score 921.5; DB 3;
Pred. No. 7.3e-81;
0; Mismatches 6;
 APPLICANT: DEAK, Tan Richard Anselm APPLICANT: JENNINGS, Michael Paul APPLICANT: MOXON, E. Richard APPLICANT: MOXON, E. Richard TITLE OF INVENTION: NOVEL SURFACE ANTIGEN FILE REFERENCE: 065064/0128
CURRENT APPLICATION NUMBER: US/09/377,155
CURRENT APPLICATION NUMBER: PCT/AUGB/01031
PRIOR FILING DATE: 1999-12-14
PRIOR FILING DATE: 1997-12-12
NUMBER OF SEQ ID NOS: 33
SOFTWARE: PatentIn Ver: 2.0
 54 NFAKETAGINGDITVHLNGIGSTLTD
 Sequence 13, Application US/09377155 Patent No. 6197312
 ; TYPE: PRT
; ORGANISM: Neisseria meningitidis
US-09-669-974-9
 ; ORGANISM: Neisseria meningitidis US-09-377-155-13
 vuery Match
Best Local Similarity 79.8%;
Matches 194; Conservative
 Query Match 90.6'
Best Local Similarity 81.0'
Matches 192; Conservative
 GENERAL INFORMATION:
 DKF 345
 DKF 201
 US-09-377-155-13
LENGTH: 594
 SEQ ID NO 13
 343
 92
 145
 86
 199
 Q
 ò
 q
 δλ
 g
 δy
 q
 g
 δy
 ò
 ò
 g
 ò
 g
 ŏ
 ద
 ò
```

Search completed: October 6, 2003, 09:36:01 Job time: 6.37514 secs

```
GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
```

OM protein - protein search, using sw model

October 6, 2003, 09:13:35 ; Search time 5.75367 Seconds (without alignments) 3359.577 Million cell updates/sec Run on:

US-09-771-382-39 1018 1 SANTLKAGDNLKIKQFTYSL.....AGWRWKTTTANGQTGQADKF 201 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

283308 seqs, 96168682 residues Searched:

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

PIR\_76:\* 1: pir1:\* 2: pir2:\* 3: pir3:\* 4: pir4:\* Database

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## STIMMARTES

| Si        | Description           | adhesin NMB0992 fi | e surface | homolog |        |        | flagellin (importe | hypothetical prote | IgA-specific metal | high-molecular-wei | flagellin - Escher | surface array prot | hypothetical prot | glucose inhibited | surface-array prot | high-molecular-wei | wall associated pr | hypothetical prote | hemolysin [importe | probable peptidogl | phase-1 flagellin | lag    | flagellin - Escher | hypothetical prote | ¥      | flagellin - Shigel | hypothetical prote | pectate lyase rela | surface protein (L | hypothetical prote |
|-----------|-----------------------|--------------------|-----------|---------|--------|--------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------|--------------------|--------------------|--------|--------------------|--------------------|--------------------|--------------------|--------------------|
| SUMMARIES | QI                    | G81133             | A81888    | 164138  | S33192 | A53465 | F90961             | F85809             | S61332             | A43855             | C48658             | 140614             | T39577            | H71713            | A56143             | B43855             | AH1184             | T23507             | AI0452             | AB1180             | S33194            | S33186 | A48658             | B86414             | T03319 | S44980             | B98047             | A97000             | AC1533             | A90541             |
|           | DB                    | 7                  | ~         | ~       | ~      | ~      | 7                  | 7                  | ~                  | ~                  | 7                  | 7                  | 7                 | 7                 | ~                  | ~                  | ~                  | 7                  | 7                  | 7                  | 7                 | 7      | 7                  | 7                  | ~      | 7                  | 7                  | 7                  | ~                  | 7                  |
|           | Query<br>Match Length | 591                | 592       | 298     | 507    | 508    | 585                | 585                | 462                | 1536               | 584                | 920                | 569               | 621               | 1109               | 1477               | 462                | 733                | 1635               | 2044               | 204               | 504    | 595                | 1020               | 653    | 550                | 2551               | 441                | 1386               | 196                |
| ø         | Query                 | 94.1               | 88.8      | 36.7    | 11.4   | 11.4   | 11.1               | 11.1               | 11.1               | 11.0               | 10.8               | 10.8               | 10.7              | 10.3              | 10.3               | 10.3               | 10.3               | 10.3               | 10.3               | 10.3               | 10.1              | 10.0   | 10.0               | 10.0               | 10.0   | 6.6                | 6.6                | 9.8                | 9.6                | 9.7                |
|           | Score                 | 957.5              | 903.5     | 374     | 116.5  | 116.5  | 113                | 113                | 112.5              | 112                | 109.5              | 109.5              | 108.5             | 105               | 105                | 105                | 104.5              | 104.5              | 104.5              | 104.5              | 103               | 102    | 102                | 102                | 101.5  | 100.5              | 100.5              | 100                | 99.2               | 66                 |
|           | Result<br>No.         | -                  | 2         | e       | 4      | 5      | 9                  | 7                  | 80                 | σ                  | 10                 | 11                 | 12                | 13                | 14                 | 15                 | 16                 | 17                 | 18                 | 19                 | 20                | 21     | 22                 | 23                 | 24     | 25                 | 26                 | 27                 | 28                 | 29                 |

A81888
probable surface fibril protein NMA1200 [imported] - Neisseria meningitidis (strain Z c; species: Neisseria meningitidis
C; Species: Neisseria meningitidis
C; Date: 05-May-2000 #sequence\_revision 05-May-2000 #text\_change 02-Feb-2001
C; Accession: A81888
R; ParkNill, J., Achtman, M.; James, K.D.; Bentley, S.D.; Churcher, C.; Klee, S.R.; Mo; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quall, M.A.; Rajandre Nature 404, 502-506, 2000

RESULT 2

| protein F59B2.12 [ | conserved hypothet | hypothetical prote | probable lipoprote | polymorphic outer | polymorphic membra | polymorphic outer | S-layer protein pr | flagellin - Escher | peroxidase (EC 1.1 | phase-1 flagellin | S-layer protein - | cell wall-associat | phase-1 flagellin | internalin protein | hypothetical prote |
|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|-------------------|--------------------|--------------------|--------------------|-------------------|-------------------|--------------------|-------------------|--------------------|--------------------|
| G88545             | AE1130             | C71513             | S62791             | C86546            | B81591             | C72078            | A36924             | B48658             | T09665             | S33191 .          | T03415            | 832920             | S33190            | AB1744             | AB2445             |
| 7                  | ~                  | 7                  | 7                  | 7                 | 7                  | 7                 | 7                  | 7                  | 7                  | 7                 | 7                 | 7                  | 7                 | 7                  | 7                  |
| 918                | 926                | 1005               | 798                | 936               | 936                | 936               | 444                | 595                | 353                | 504               | 1361              | 2334               | 504               | 940                | 918                |
| 9.7                | 9.7                | 9.7                | 9.7                | 9.7               | 9.7                | 9.7               | 9.6                | 9.6                | 9.5                | 9.5               | 9.5               | 9.5                | 9.4               | 9.4                | 9.4                |
| 66                 | 66                 | 66                 | 98.5               | 98.5              | 98.5               | 98.5              | 98                 | 86                 | 97                 | 97                | 97                | 96.5               | 96                | 96                 | 95.5               |
| 30                 | 31                 | 32                 | 33                 | 34                | 35                 | 36                | 37                 | 38                 | 39                 | 40                | 4.1               | 42                 | 43                | 44                 | 45                 |

## ALIGNMENTS

| RESULT 1  G81133  adhesin NMB0992 [Imported] - Neisseria meningitidis (strain MC58 serogroup B)  C.Species: Neisseria meningitidis  C.Species: Neisseria meningitidis  C.Species: 31-Mar-2000 #sequence_revision 31-Mar-2000 #text_change 19-Jan-2001  C.Speciesshon: G81133  C.Faccesshon: G81133  R.Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, K.E.; Eisen, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty, B. Tri, H.; Vanathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M. A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoll, R.; A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A;Recence number: A81000; MUID:20175755; PMID:10710307  A;Status: preliminary  A;Residues: 1-591 < TET> | A;Cross-references: GB:AE002450; GB:AE002098; NID:g7226229; PIDN:AAF41395.1; PID:g722 A;Experimental source: serogroup B, strain MC58 C;Genetics: A;Gene: NMB0992 A;Gene: NMB0992 Bourry Match Best Local Similarity 85.7%; Pred. No. 6.4e-60; Matches 198; Conservative 0; Mismatches 0; Indels 33; Gaps 3; | 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET 59 | 60 AGTNGDTTVHLNGIGSTLTD | 98 KNUDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150<br> | 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGOTGQADKF 201<br> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------|------------------------------------------------------------------|-----------------------------------------------------------------|
| ж о й о о о о к к н й द द द द द द द                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4404                                                                                                                                                                                                                                                                                                         | Qy<br>Dp                                                      | Qy                      | Qy<br>Db                                                         | QO                                                              |

11;

31;

Indels

Length 507;

DB 2; 73; 293

62

```
phase-1 flagellin - Salmonella oranienburg (fragment)
C;Species: Salmonella oranienburg
C;Species: Salmonella oranienburg
C;Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 26-Aug-1999
C;Accession: 331392
R;Masten, B.J.; Joys, T.M.
Submitted to the EMBL Data Library, September 1992
A;Description: Molecular analysis of the flagellar antigen complex of Salmonella.
A;Reference number: 533185
A;Accession: 533192
A;Accession: 533192
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-507 < MAS>
A;Residues: 1-507 < MAS>
A;Residues: 1-507 < MAS>
C;Superfamily: flagellin
 63 NGDTTVH--LNG--IGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSAD 115
 TKTTTVNVESKD----DKKKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTD 164
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET-AGT
 Query Match 11.4%; Score 116.5; DR Best Local Similarity 31.1%; Pred. No. 0.69; Matches 59; Conservative 27; Mismatches
 Conservative
 EGEGLVTAKE 174
 INEDAAAAKK 415
 A;Gene: flic
C;Superfamily: flagellin
 Best Local Similarity
Matches 59; Conserv
 116
 165
 406
 63
 116
 Query Match
 ŏ
 qq
 Qγ
 g
 δ
 q
 ŏ
 g
 qq
 ò
 q
 qq
 δ
 ŏ
 A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-592 <PAR>
A;Residues: 1-592 <PAR>
A;Cross-references: GB:AL162755; GB:AL157959; NID:g7379742; PIDN:CAB84461.1; PID:g737989
A;Experimental source: serogroup A, strain Z2491
C;Genetics:
 C.Species: Heamophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 24-Oct-1997
C;Accession: 164138
E;Caccession: 164138
E;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage, P.; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weldman, J. Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weldman, Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Venter, A;Aritle: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Accession: 164138
A;Accession: 164138
A;Caccession: Legic acid sequence not shown; translation not shown
A;Molecule type: DNA
A;Residues: 1298 <TIGR>
A;Cross-references: GB:U32846; GB:L42023; NID:g1574588; PID:g1574589; TIGR:HI1732
A;Reference number: A81775; MUID:20222556; PMID:10761919
 9
 IKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 AGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSV 142
 264
 204
 53
 NFAKETAGTNGDTTVHLNGIGSTLTD--------RAASVKDVLNAGWN 93
 20
 83
 EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL
 4 TLKAGDNLKI------KQFTYSLKKDLTDLTSVGTEKLSFSAN------GNKVNITSDT
 KGLNFAKETAGTNGDTTVHLNGIGSTLTD---------RAASVKDVLN
 Gaps
 Gaps
 39;
 46;
 Length 592;
 adhesin homolog HI1732 - Haemophilus influenzae (strain Rd KW20)
 36.7%; Score 374; DB 2; Length 298; 44.4%; Pred. No. 3e-19; ative 21; Mismatches 48; Indels
 7; Indels
 .,
 Score 903.5; DB
Pred. No. 4e-56;
3; Mismatches
 |||::|||:||||
||IKDNNGKLLTGKQLKDANTGTATNATE 291
 IKEKDGKLVTGKD--KGENGSSTDEGE 167
 88.8%;
 Query Match 88.8
Best Local Similarity 79.3
Matches 188; Conservative
 Query Match
Best Local Similarity 44.45
Matches 92; Conservative
 A; Gene: NMA1200
 54
 94
 51
 205
 163
 145
 90
 265
 φ
 a
 οy
 q
 a
 ò
 δ
 g
 ò
 g
 ò
 qq
 õ
 g
 qq
 ò
```

```
11;
 NGDTTVH--LNG--IGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSAD 115
 347
 294
 TKTTTVNVESKD----NGKKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTD 164
 62
Cispecies: Salmonella banana
Cispecies: Salmonella
Rich, J.; Nelson, K.; McWhorter, A.C.; Whittam, T.S.; Selander, R.K.
Proc. Natl. Acad. Sci. U.S.A. 91, 2552-2556, 1994
A;Title: Recombinational basis of servoar diversity in Salmonella enterica.
A;Reference number: A53465; MUID:94195780; PMID:8146152
A;Sccession: A53465
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Residues: 1-508 < PRESS.
 295 DGNGTVSTTINGEKVTLTISDIGASATDVNSA--KIQSSKDV----YTSVVSGOFTFAD
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET-AGT
 A;Cross-references: EMBL:U06202; NID:g476243; PIDN:AAA17861.1; PID:g476244 C;Genetics:
 Length 508;
 DB 2;
 11.4%; Score 116.5; DE 31.1%; Pred. No. 0.69; tive 27; Mismatches
 EGEGLUTAKE 174
 165
```

RESULT 4

```
high-molecular-weight surface-exposed protein HMW1 - Haemophilus influenzae C; Species: Haemophilus influenzae C; Species: Haemophilus influenzae C; Date: 10-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 08-Oct-1999 C; Accession: A43855 R; Barenkamp, S.J.; Leininger, E. Infect. Immun. 60, 1302-1313, 1992 A; Title: Cloning, expression, and DNA sequence analysis of genes encoding nontypeable
 Cyaccession: S61327
Ricambolt, H: Poulsen, K: Mogens, K.
Ricambolt, H: Poulsen, K: Mogens, K.
A; Itle: Comparative characterization of the iga gene encoding IgAl protease in Neiss A; Reference number: S61314; MUID:95302961; PMID:7783620
A; Recession: S61332
A; Returns: preliminary; nucleic acid sequence not shown
A; Molecule type: DNA
 Haemophilus influenzae (st
 A; Reference number: A43855; MUID:92192797; PMID:1548058
A; Reference number: A43855
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-1536 CBAR>
A; Cross-references: GB:U08876; GB:M84616; NID:9475770; PIDN:AAA20527.1; PID:9475771
A; Note: Sequence inconsistent with the nucleotide translation
A; Note: sequence extracted from NCBI backbone (NCBIN:89235, NCBIP:89239)
 10;
 367
 98 KNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKG 157
 401
---LITDAAFDKLGNGDK --- VTVGGVDYTYNAK 241
 57
 97
 A;Variety: HK635
C;Date: 14-Feb-1997 #sequence_revision 13-Mar-1997 #text_change 08-Dec-2000
 S------VAEGKTVTWKVHNPQSDRL--AKIGKGTLIV------EGKG
 ----KVNITSDTKGLNFAK
 259 NIYKSOFTKDVLNKDSAGLLK-GNTQYNWTSNGNTSMISNGSELLEVNLFDNSKHTN--R
 A; Residues: 1-462 <LOM>
A; Cross-references: EMBL:X82488; NID:g732714; PIDN:CAA57871.1; PID:g732715
A; Experimental source: strain HK655
A; Experimental source: strain HK655
A; Note: the authors did not translate the codon for residue 462
 69;
 Length 1536;
 Length
 Indels
 58 ETAGTNGDTTVHLNGIGSTLTDRAASVKDVLNAG------
 (EC 3.4.24.13) homolog
 DB 2;
 59;
 242 SGDFTTTK-----STAGTGVDAAAQAADSASK 268
 DGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNK 181
 DB 2;
 C;Superfamily: IgA-specific metalloendopeptidase C;Keywords: hydrolase; metalloproteinase
 Score 112.5; I
Pred. No. 1.2;
 10 NEKIKQFTYS-LKKDLTDLTSVGTEKLSFSANGN-
 Score 112; DB Pred. No. 5.1;
 24; Mismatches
 158 ENGSSTDEGEGLVTAKEVIDAVNK 181
 402 ENKGSLKVGDGTVILKQQADANNK 425
191 LTSAGAKLNTTTGLYDLKTENTL--
 11.0%;
21.9%;
 IgA-specific metalloendopeptidase N;Alternate names: IgAl protease C;Species: Haemophilus influenzae
 11.18; 25.58;
 Conservative
 Query Match
Best Local Similarity
Matches 52; Conserv
 Query Match
Best Local Similarity
 detella pertussis.
 147
 QQ
 Db
 ò
 δ
 g
 δ
 δ
 g
 g
 ò
 a
 A;Molecule type: DNA
A;Residues: 1-585 <STO>
A;Cross-references: GB:AE005174; NID:g12516024; PIDN:AAG56938.1; GSPDB:GN00145; UWGP.Z3G
A;Experimental source: strain 0157:H7, substrain EDL933
 gend
 hypothetical protein flic [imported] - Escherichia coli (strain 0157:H7, substrain EDL93 C; Species: Escherichia coli (Species: Escherichia (Species: Escherichia (Species: Escherichia (Species: Species: Species
 C. G.
 figgellin [imported] - Escherichia coli (strain O157:H7, substrain RIMD 0509952)
C;Species: Escherichia coli
C;Species: Bscherichia coli
C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001
C;Accession: F90961
R;Hayashi, T.; Makino, K.; Ohnishi, M.; Kurokawa, K.; Ishii, K.; Yokoyama, K.; Han, Gasawara, N.; Yasunagay, T.; Kuhara, S.; Shiba, T.; Hattori, M.; Shinagawa, H.
DNA Res: 8, 11-22, 2001
A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 and excession: F90961
A;Status: preliminary
 7;
 7;
 VLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK 146
 87 VLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK 146
 A;Molecule type: DNA
A;Residudes: 1-585 <HAY>
A;Cross-references: GB:BA000007; PIDN:BAB36085.1; PID:g13362130; GSPDB:GN00154
A;Experimental source: strain 0157:H7, substrain RIMD 0509952
 27 LTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDRAASVKD 86
 27 LTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDRAASVKD
 24; Gaps
 Gaps
 24;
 ch 11.1%; Score 113; DB 2; Length 585; 1 Similarity 27.1%; Pred. No. 1.4; 42; Conservative 27; Mismatches 62; Indels
 Length 585;
 62; Indels
 | | | | : | : | : | SGDFTTTK-----STAGTGVDAAAQAADSASK 268
 DGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNK 181
 DB 2;
 Query Match 11.1%; Score 113; DB Best Local Similarity 27.1%; Pred. No. 1.4; Matches 42; Conservative 27; Mismatches
C;Superfamily: flagellin
 C;Superfamily: flagellin
 A; Accession: F85809
A; Status: preliminary
 A; Gene: ECs2662
 Query Match
Best Local S
Matches 42
 147
 87
 C; Genetics
 A; Gene:
 셤
 g
 οχ
 a
 qq
 a
 ò
 ö
 ò
 ò
```

607

98

55

```
::| | :||: | ::| | ::: | | :: | | :: | | :: | | :: | | :: | | :: | | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | :: | ::
 NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKK-------TEVKIGAKTSV 142
 DTTVHLNGIGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSADTKT-TT 120
 121 VNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVN 180
 RESULT 13
H71713
Qjucose inhibited division protein A (gidA) RP056 - Rickettsia prowazekii
C;Species: Rickettsia prowazekii
C;Species: 21-Nov-1998 #sequence_revision 21-Nov-1998 #text_change 03-Nov-2000
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSF----SANGNKVNIT----SDTKGLNF
 | ||: |: | : | || || 350 KKLKAGSLIDGGEGNDTIIMK--ASALADAATLGMIKNIENVTVSDALSANTDVSASSFV
 56 AKETAGT ---- NGDTTVHLNGIGSTLTDRA ----- ASVKDVLNAGWNIKGVK --
 9 DNLKIKQFTYSLKKD----LTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNG
 Gaps
 Gaps
A;Wolecule type: DNA
A;Residues: 1-920 <RES>
A;Cross-references: GB:L15800; NID:g289533; PIDN:AAA23019.1; PID:g289534
C;Genetics:
A;Gene: sapA
 IKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTAN 192
 667 INQGDKNVAAGAQ--TKGLKIDDG-----IESVNITSVAKDNTTAN 705
 25;
 Length 569;
 Length 920;
 Indels
 81;
 19;
 DB 2;
 DB 2;
 10.7%; Score 108.5; DE 29.1%; Pred. No. 2.9; ive 25; Mismatches
 10.8%; Score 109.5; D 23.0%; Pred. No. 4.3; iive 33; Mismatches
 Best Local Similarity 23.0%
Matches 53; Conservative
 Query Match
Best Local Similarity 29.1
Matches 53; Conservative
 A, Gene: SPDB:SPBC16E9.02c
A, Map position: 2
A, Introns: 33/3; 57/1
 :|
EA 559
 KA 182
 66
 809
 143
 65
 450
 181
 Query Match
 RESULT 12
 qq
 g
 ò
 qq
 ò
 q
 δ
 g
 δ
 a
 δ
 à
 g
 οy
 flagellin - Escherichia coli (strain U5-41)
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispecies: Escherichia coli
Cispate: O3-May-1994 #sequence_revision 03-May-1994 #text_change 26-Aug-1999
Cisconomia cui cui cui cui cui ci minitield, C.
Brischoenhals, G.; Whitfield, C.
Brischoenhals, G.; Whitfield, C.
Brischoenhals, G.; Whitfield, C.
Britle: Comparative analysis of flagellin sequences from Escherichia coli strains posse
A; Reference number: A48658 MUID:93374833; PMID:8366026
A; Accession: C48658
A; Status: preliminary
A; Molecule type: DNA
A; Residues: 1-584 <SCH>
 surface array protein - Campylobacter fetus
C;Species: Campylobacter fetus
C;Species: Campylobacter fetus
C;Date: 12-Aug-1996 #sequence_revision 12-Aug-1996 #text_change 08-oct-1999
C;Accession: I40614
Fyrumnuru. M.K.R.; Blasser, M.J.
Proc. Natl. Acad. Sci. U.S.A. 90, 7265-7269, 1993
A;Title: Rearrangement of sapA homologs with conserved and variable regions in Campyloba A;Reference number: I40614; MUID:99348254; PMID:89346244
A;Scatus: preliminary; translated from GB/EMBL/DDBJ
 SSSTYRTIISGNITNKNGDLNITNEGSDTEMQIGGDVS---QKEGNLTISSDKINITKQI 1009
 87 VLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEK 146
 -----RGVKNVDFV-----RTYDTVEFLSADTK 117
 893 VNIAGNLTVESNANFKAITNFTFNVGGLFDNKGNSNISIAKGGARFKDIDNSKNLSITTN 952
 49
 86
 118 TTTV-----NVESK-----DNGKKTEVKIGAKTSVIKEKDGKLVTGKDK-----
 50 TKGLNFAKETAGT--NGDTTVHLNG----IGSTLTDRAASV---KDV-----LNAGWNI
 -----GENGSSTDEGEGLVTAK----EVIDAVNKAGWRMKTTTAN------GQTGQA
 27 LTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDRAASVKD
 Gaps
 A;Cross-references: GB:L07388; NID:g290438; PIDN:AAA23798.1; PID:g290439
C;Superfamily: flagellin
 25;
 110;
 Length 584;
 5 LKAGDNLKIK----QFTYSLKKDLTDLTSVGTEKLSFSANGN----
 91; Indels
 Indels
 Query Match 10.8%; Score 109.5; DB 2; Best Local Similarity 27.1%; Pred. No. 2.5; Matches 42; Conservative 27; Mismatches 61;
 DGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNK 181
 Mismatches
34;
 Conservative
 D 1070
 D 199
99
 1070
 95
 157
 191
 147
Matches
 RESULT 11
 ò
 q
 õ
 g
 δ
 g
 q
 g
 δ
 a
 ò
 g
 ò
 g
 ò
 à
 g
 ŏ
```

```
C;Accession: B43855
R;Barenkamp, S.J.; Leininger, E.
Infect. Immun. 60, 1302-1313, 1992
A;Title: Cloning, expression, and DNA sequence analysis of genes encoding nontypeable
 1243 TEGAAT--LTATGNTLTTEAGSSITSTKGQVDLLAQNGSIAGSINAANV-----TL 1291
 DTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTD-----EGEG 168
 62 TNGDTTVHLNGIGSTLTDRAAS-----VKDVLNAGWNIKGVKNVDFVRTYDTVEFLSA 114
 high-molecular-weight surface-exposed protein - Haemophilus influenzae
C;Species: Haemophilus influenzae
C;Date: 10-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 18-Nov-1994
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAK--ETAG
 A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-177 <BAR>
A;Note: sequence inconsistent with the nucleotide translation
A;Note: sequence extracted from NCBI backbone (NCBIN:89237, NCBIP:89240)
 10.3%; Score 105; DB 2; Length 1477; 28.3%; Pred. No. 15; Live 23; Mismatches 76; Indels 4
 detella pertussis.
A;Reference number: A43855; MUID:92192797; PMID:1548058
A;Accession: B43855
 1342 SVTA-ATSSSVNITG---DLNTVNG 1362
 6, 2003, 09:33:42
 169 LVTAKEVIDAVNKAGWRMKTTTANG 193
 453 STADTLQPTLTNIEKVTIDGNT 474
 Best Local Similarity 28.3
Matches 58; Conservative
 Search completed: October
Job time: 7.75367 secs
 115
 Query Match
 QΩ
 δλ
 δ
 g
 δ
 a
 δλ
 q
 qq
C; Accession: H71713
R; Andersson, S.G.E.; Zomorodipour, A.; Andersson, J.O.; Sicheritz-Ponten, T.; Alsmark, U Nature 396, 133-140, 199
A; Title: The genome sequence of Rickettsia prowazekii and the origin of mitochondria. A; Reference number: A71630; MUID:99039499; PMID:9823893
A; Accession: H71713
A; Accession: H71713
A; Molecule type: DNA
A; Residues: 1-621 <AND>A; Residues: 1-621 <AND>A; Cross-references: GB:AJ235270; GB:AJ235269; NID:93860652; PIDN:CAA14527.1; PID:9386062
C; Genetics:
 C; Species: Campylobacter fetus
C; Date: 03.Nov-1995 #sequence_revision 03.Nov-1995 #text_change 08-oct-1999
C; Accession. 356143
R; Dworkin, J.; Tummuru, M.K.R.; Blaser, M.J.
J; Bacteriol. 177, 1734-1741, 1995
J; Title: A lipopolysaccharide-binding domain of the Campylobacter fetus S-layer protein A; Reference number: A56143; MUID:95204338; PMID:7896695
A; Accession: A56143
 9
 426
 -----TKTT 119
 336 QNLKVNGVGAKGASVAITADKIETLNLNTTGSQSFVSADVASISVKGNANLSLATGAKTT 395
 120 TVNVESKDNGKKTEVKIGAKTSVIKEKDGK-LVTGKDKGEN-----GSSTDEGEGLVTAK 173
 49
 50 TKGLNFAKETAGTNGD-----TTVHLNGIGST------LTDRAASVKDV 87
 surface-array protein homolog sapA2 - Campylobacter fetus (strain 82-40 LP3)
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK---GLNFAKETA
 61 GINGDTTVHLNGIGSTLTDRAASVKD----VLNAGWNIKGVKNVDFVRTYDTVEFLSADT
 3 NTLKAGDN------LKIKQFTYSLKKDLTDLTSVG----TEKLSFSANGNKVNITSD
 Gaps
 A;Cross-references: GB:S76860; NID:g913763; PIDN:AAB33871.1; PID:g913764 A;Note: this gene appeared to be silent in strain 82-40 LP3 C;Genetics:
 24;
 82;
 Length 1109;
 Length 621;
 10.3%; Score 105; DB 2; Length 11 24.0%; Pred. No. 11; ive 27; Mismatches 90; Indels
 67; Indels
 117 KTTTVNVESK-DNGKKTEVKIGAKTSVIKEKDGKLVTGKDK 156
 SRSEYRLSLRADNADLRLTELGIKIGVITEKRKKFFTKKCK 467
 88 LNAGWNIKGVKNVDFVRTYDTVE------FLSAD---
 Score 105; DB 2;
Pred. No. 5.6;
 10.3%; Sco. 27.3%; Pred. No. 5...
 174 EVIDAVNKAGWRMKTTTANGQT 195
 Query Match 10.35
Best Local Similarity 27.35
Matches 44; Conservative
 63; Conservative
 A;Gene: gidA; RP056
C;Superfamily: gidA protein
 Similarity
 A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-1109 <DWO>
 427
 Query Match
 A; Gene: sapA2
 RESULT 14
 Matches
 a
 ò
 q
 ò
 g
 õ
 දු
 δ
 g
 ò
 g
 δ
```

12;

THIS PAGE BLANK (USPTO)

us-09-771-382-39.rsp

```
GenCore version 5.1.6 Copyright (c) 1993 - 2003 Compugen Ltd.
```

| _       |
|---------|
| mode]   |
| 30      |
| using   |
| search, |
| protein |
| 1       |
| protein |
| Ö       |

October 6, 2003, 09:06:20 ; Search time 3.10395 Seconds (without alignments) 3045.266 Million cell updates/sec Run on:

US-09-771-382-39 1018 1 SANTLKAGDNLKIKQFTYSL......AGWRWKTTTANGQTGQADKF 201 Title: Perfect score: Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

127863 seqs, 47026705 residues Searched:

127863 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt\_41:\* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

| S         | ö              | sa   | Q9ze90 rickettsia |            |            | Q08860 shiqella fl |            | O84462 chlamydia t | Q50288 mycoplasma | _          | lactobacil | Q06981 salmonella |            | m          |            | _          |            | bacil   | Q12840 homo sapien | strep      |         | Q9pjt6 chlamydia m |            |            |            |            | 0          |            | 09y834 penicillium | _          | P46210 aquifex pyr | 314 ricketts | Q53047 r outer mem | ellonomles C70300 |
|-----------|----------------|------|-------------------|------------|------------|--------------------|------------|--------------------|-------------------|------------|------------|-------------------|------------|------------|------------|------------|------------|---------|--------------------|------------|---------|--------------------|------------|------------|------------|------------|------------|------------|--------------------|------------|--------------------|--------------|--------------------|-------------------|
| SUMMARIES |                | . "1 | GIDA_RICPR        | FLIC_SALSE | FLIC_SALBU | FLIC_SHIFL         | YMJB_CAEEL | Y456_CHLTR         | YCOO_MYCPN        | PMP7_CHLPN | SLAP_LACAC | FLIC_SALMC        | FLJB_SALTY | WAPA_BACSU | FLIC_SALMO | RPOB_MYCGE | HLYA_SERMA | P_BACLI | KINN_HUMAN         | GTF2_STRDO | B_PSEAE | Y741_CHLMU         | IGAO_HAEIN | IGA2_HAEIN | FLC1_PROMI | YC88_MYCPN | CAGA_HELPY | EBA1_PLAFC | PGL1_PENOL         | FLIC_SALTY | FLAA_AQUPY         | 20K_RICRI    | OMPB_RICRI         | CALEN             |
| -         | G.             |      | GID               | FLI        | FLI        | FLI                | YMJ        | Y45                | YC0               | PMP        | SLA        | FLI               | FL         | WAP        | FLI        | RPO        | HLY        | SLAP    | KIN                | GTF        | FLD     | X74                | IGA        | IGA        | FLC        | YC8        | CAG        | EBA        | PGL                | FLI        | FLA                | 120          | OMP                | DI.TO             |
|           | DB             | -    | -                 | -          | ~          | -                  | -          | -                  | -                 | -          | _          | ~                 | -          | 7          | -          | -          | -          | Н       | П                  | -          | Н       | Н                  | -          | -          | -          | -          |            | П          |                    | П          | Н                  | -            | -                  | -                 |
|           | Length         | 507  | 621               | 504        | 504        | 550                | 918        | 1005               | 798               | 936        | 444        | 204               | 202        | 2334       | 204        | 1390       | 1608       | 874     | 1032               | 1592       | 474     | 1007               | 1694       | 1702       | 365        | 787        | 1186       | 1435       | 370                | 494        | 501                | 0            | 1654               | 207               |
| ø         | Query<br>Match | 11.4 |                   | 10.1       |            | 6.6                | 9.7        |                    |                   |            |            |                   | o          |            | •          | •          | •          | •       | •                  | •          | •       | 9.5                | •          | •          | •          | •          |            |            |                    |            |                    | 9.1          |                    |                   |
|           | Score          | ~    | 105               | 103        | 102        | 100.5              | 66         | 66                 | 98.5              | 98.5       | 86         | 97                | 96.5       | 96.5       | 96         | 95         | 94.5       | 94      | 94                 | o          | ë.      | 93.5               | m.         | e.         | 93         | 93         | 93         | σ          | 'n                 | 92.5       | ς.                 | ς.           | ς.                 | S                 |
|           | Result<br>No.  | 1    | 7                 | m          | 4          | 5                  | 9          | 7                  | æ                 | σ          | 10         | 11                | 12         | 13         | 14         | 15         | 16         | 17      | 18                 | 19         | 20      | 21                 | 22         | 23         | 24         | 25         | 26         | 27         | 28                 | 59         | 30                 | 31           | 32                 | 33                |

| O52959 salmonella<br>O31000 escherichia | Q9zlt1 helicobacte<br>P32051 escherichia | 024618 drosophila | P42/82 naemopnilus<br>P96989 r outer mem | 051575 borrelia bu | 031852 bacillus su | Q06971 salmonella | Q8xqg4 ralstonia s | P52143 escherichia |
|-----------------------------------------|------------------------------------------|-------------------|------------------------------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| FLIC_SALNA<br>EAE_ECO11                 | CAGA_HELPJ<br>YDEK_ECOLI                 | EXU1_DROPS        | IGAI_HAEIN<br>OMPB_RICTY                 | K1PF_BORBU         | YOJL_BACSU         | FLIC_SALDU        | NAB2_RALSO         | YPJA_ECOLI         |
| 1                                       |                                          | ⊶,                |                                          | -                  | -                  | Н                 | Н                  | Н                  |
| 504<br>935                              | 1167                                     | 497               | 1541<br>1645                             | 307                | 414                | 504               | 536                | 1569               |
| 0.6                                     | 0.6                                      | 0.6               | y 0                                      | 8.9                | 6.8                | 8<br>6.           | 6.8                | 8.9                |
| 92<br>92                                | 92<br>92                                 | 91.5              | 91.5                                     | 91                 | 91                 | 91                | 91                 | 91                 |
| 34<br>35                                | 36                                       | 38                | 2.4<br>2.0                               | 41                 | 42                 | 43                | 44                 | 45                 |

## ALIGNMENTS

| RESULT<br>FLIC_S | 1<br>ALON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S D              | FLIC_SALON STANDARD; PRT; 507 AA.<br>006974;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 占占               | 01-0CT-1996 (Rel. 34, Created)<br>01-0CT-1996 (Rel. 34, Last sequence update)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                  | (Rel. 39,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| G S              | FLIC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SO               | Salmonella oranienberg.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3 5              | Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;<br>Enterobacteriaceae: Salmonella                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ŏ                | NCBI_TaxID=28147;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| RN               | [1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| RP               | SEQUENCE FROM N.A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Z K              | STRAIN=ATCC 9239;<br>MEDLINE=93374829; PubMed=7690024;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| RA               | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| RT               | "Molecular analyses of the Salmonella g flagellar antigen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| R                | complex."; + nate and 175 For one of the contraction of the contractio |
| ξ<br>Σ           | U. BECCEFIOL. 17.3:3394-3363(1994).<br>FINCTION. FLACELLIN IS THE SIBINIT BECTFIN WHICH DOLVMEDIZES TO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3 8              | FORM THE FILAMENTS OF BACTERIAL FLAGELLA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ပ္ပ              | -!- MISCELLANEOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ပ္ပ              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ပ္ပ              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ပ္ပ              | -!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 3 5              | This SWISS-PROT entry is copyright It is produced through a collaboration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 88               | between the Swiss Institute of Bioinformatics and the EMBL outstation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ပ္ပ              | the European Bioinformatics Institute. There are no restrictions on its                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ပ္ပ              | use by non-profit institutions as long as its content is in no way                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ပ္ပ              | modified and this statement is not removed. Usage by and for commercial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ည                | entities requires a license agreement (See http://www.isb-sib.ch/announce/                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ខ្ល              | or send an email to license@isb-sib.ch).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ץ<br>ב           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| z c              | a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| DR               | PIR; S33192; S33192.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| DR               | Pro; IPR001029;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| DR               | InterPro; IPR001492; FlagellinN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| DR<br>1          | Pfam; PF00700; Flagellin_C; 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3 E              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ž                | incoco, incoco |
| FT               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ŏs               | SEQUENCE 507 AA; 53065 MW; 17A8BB4BBA4A6125 CRC64;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Query            | Query Match 11.4%; Score 116.5; DB 1; Length 507;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Mat              | nes 59; Conservative 27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| δy               | 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET-AGT 62                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| QQ               | GDTFDYKGVSFT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| t<br>I           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

```
(Rel. 34, Created)
(Rel. 34, Last sequ
(Rel. 39, Last anno
 0 0 E
504 AA; 52864 MW;
 EMBL; Z15072; CAA78781.1; -.
 PRINTS; PR00207; FLAGELLIN
 53; Conservative
 STANDARD;
 S33194; S33194
 Similarity
 SEQUENCE FROM N.A.
 01-OCT-1996 (
01-OCT-1996 (
30-MAY-2000 (
 FLIC_SALSE
 INIT_MET
SEQUENCE
 Flagella.
 Query Match
Best Local
 RESULT 4
FLIC_SALBU
 FLIC_SALSE
 Matches
 ò
 g
 g
 δλ
 qq
 ò
 δλ
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to licenseeisb-sib.ch).
 9
 294 DGNGTVSTTINGEKVTLTISDIGASATDVNSA--KIQSSKDV----YTSVVSGQFTFAD 346
NGDTTVH--LNG--IGSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSAD 115
 TKTTTVNVESKD----NGKKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTD 164
 347 -KTKNESAKLSDLEANNAVKGESKITVNGAEYTANAAGDKVTLAGKTMFIDKTASGVSTL 405
 TIPGLENAQVLRPGYAIEYDYVD-------PREINVTLETKKITGLYFAGQIN 368
 GTNGDTTVHLNGIGSTLTDRAASVKD----VLNAGWNIKGVKNVDFVRTYDTVEFLSADT 116
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTK---GLNFAKETA
 Gaps
 STRAIN-Madrid E;

AnderSon S.G.E., Zomordipour A., Andersson J.O.,

Anderson S.G.E., Zomordipour A., Andersson J.O.,

Sicheritz-Ponten T., Alsmark U.C.M., Podowski R.M., Naeslund A.K.,

Eriksson A.-S., Winkler H.H., Kurland C.G.;

"The genome sequence of Rickettsia prowazekii and the origin of mitochondria.";

Nature 396:133-140(1998).
 24;
 Bacteria; Proteobacteria; Alphaproteobacteria; Rickettsiales;
Rickettsiaceae; Rickettsieae; Rickettsia
 Length 621;
 Indels
 621 AA; 69195 MW; 7379A85B4E6ACADF CRC64;
 67;
 DB 1;
 28-FEB-2003 (Rel. 4), Last sequence update) Glucose inhibited division protein A. GIDA OR RP056.
 621 AA.
 -!- FUNCTION: NOT KNOWN.
 Mismatches
 Score 105;
Pred. No. 3;
 10.3%; Scc
27.3%; Pre
tive 26;
 30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last seq
 EMBL; AJ235270; CAA14527.1; -.
 44; Conservative
 STANDARD;
 165 EGEGLVTAKE 174
 406 INEDAAAAKK 415
 Rickettsia prowazekii.
 SEQUENCE FROM N.A.
 Local Similarity
 PROSITE; PS01281;
Complete proteome.
 NCBI_TaxID=782;
 RICPR
 SEQUENCE
 61
 Query Match
 GIDA_RIC
09ZE90;
 g
 ò
 a
 ò
 a
 HID DESTRUCTION OF THE PROPERTY OF THE PROPERT
 q
 ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 11;
249 TTKSTAGTDEAKAIASAIKGGKEGDTFDYKGVSFTIDTKAGNDGNGTVSTTINGEKVTLT 308
 309 VADITAGAANVNDA--TLOSSKNV----YTSVVNGQF-TFDDKTKNESAKLSDLEANNA 360
 78
 25 IDLTSVGTEK --- LSFSANGNKVNITSDTKGLNFAKET-AGTNGDTTVH--LNGIGSTLT
 79 -- DRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSADTKTTTVNVESKD----NG
 -i- MISCELLANEOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE BETWEEN THE PRODUCTION OF 2 ANTIGENIC FORMS OF FLAGELLA, TERMED PHASE-1 AND PHASE-2. AECH SPECIFIED BY SEPARATE STRUCTURAL GENES.-:- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 30; Gaps
 -!- FUNCTION: FLAGELLIN IS THE SÜBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
 Salmonella senftenberg.
Bacteria, Poteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
NGBL_TaxID=28150;
 130 KKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTDEGEGLVTAKE 174
 361 VKGESKITVNGAEYTANAAGDKVTLAGKTMFIDKTASGVSTLINEDAAAAKK 412
 "Molecular analyses of the Salmonella g. . . flagellar antigen
 Length 504;
 62; Indels
 BY SIMILARITY.
BFD14C4F125C2BAC CRC64;
 SESEYRLSLRADNADLRLTELGIKIGVITEKRKFFTKKCK
 117 KTTTVNVESK-DNGKKTEVKIGAKTSVIKEKDGKLVTGKDK
 10.1%; Score 103; DB 1; 30.8%; Pred. No. 3.3;
 Last sequence update)
Last annotation update)
 27; Mismatches
 complex.";
J. Bacteriol. 175:5359-5365(1993)
 MEDLINE=93374829; PubMed=7690024;
Masten B.J., Joys T.M.;
 InterPro: IPR001029; Flagellin_C. InterPro: IPR0010492; FlagellinN. Pfam: PF00700; Flagellin_N: IPRam: PF00669; Flagellin_N: 1.
 Flagellin (Phase-1-C flagellin).
```

ᠬ

```
NCBI_TaxID=623;
 RESULT 6
YMJB_CAEEL
 Best Loc
Matches
 qq
 ŏ
 q
 ò
 g
 δ
 g
 δ
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 11;
 249 TIKSTAGTDEAKAIAGAIKGGKEGDTFDYKGVSFTIDTKAGNDGNGTVSTTINGEKVTLT 308
 79 -- DRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSADTKTTTVNVESKD----NG 129
 78
 25 TDLTSVGTEK---LSFSANGNKVNITSDTKGLNFAKET-AGTNGDTTVH--LNGIGSTLT
 J. Bacteriol. 175:5359-5365(1993).

-1- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.

-1- MISCELLANEOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE BETWEEN THE PRODUCTION OF 2 ANTIGENIC FORMS OF FLAGELLA, TERMED PHASE-1 AND PHASE-2, EACH SPECIFIED BY SEPARATE STRUCTURAL GENES.

-1- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
 130 KKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTDEGEGLVTAKE 174
 Shigella flexneri.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Shigella.
 30;
 MEDLINE-93374829; PubMed-7690024;
Masten B.J., Joys T.M.;
"Molecular analyses of the Salmonella g. . . flagellar antigen
 Length 504;
 62; Indels
 BY SIMILARITY.
1FD1498751B6475E CRC64;
 10.0%; Score 102; DB 1;
30.8%; Pred. No. 3.8;
tive 27; Mismatches 62;
 01-OCT-1996 (Rel. 34, Created)
01-OCT-1996 (Rel. 34, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
FLIC.
 01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Flagellin.
 504 AA.
 PRT;
 PRT;
 InterPro; IPR001029; Flagellin_C. InterPro; IPR001492; FlagellinN.
 Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
 504 AA; 52790 MW;
 EMBL; Z15065; CAA78774.1; -. PIR; S33186; S33186.
 PRINTS; PR00207; FLAGELLIN
 Conservative
 STANDARD;
 STANDARD;
 Salmonella budapest.
 Best Local Similarity
 SEQUENCE FROM N.A.
 NCBI_TaxID=28143;
 0
 FLIC OR SF1966.
 53;
 FLIC_SHIFL
Q08860;
 Flagella.
 complex."
 SEQUENCE
 Query Match
 FLIC_SHIFL
 Matches
 OC OS OC OC
ò
 g
 ò
 셤
 ò
 a
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions and a sits content is in no way modified and this statement is not removed. Usage by and for commercial
 entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 111
 357 PDTITYSVTGAKVDQAAFDKAVSTSGNNVDFTTAGYSVNGTTGAVTKGVDSV----YVDN 412
 112 LSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVT 171
 413 NEALTTSDTVDFYLQDDGSVTN---GSGKAVYKDADGKLTT--DAETKAATT--ADPLKA 465
 63
 "Genome sequence of Shigella flexneri 2a: insights into pathogenicity through comparison with genomes of Escherichia coli K12 and O157."; Nucleic Acids Res. 30:4432-4441(2002).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
-!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 64 GDT-TVHLNG--IGSTLTDRAASVK----DVLNAGWNIKG-----VKNVDFVRTYDTVEF
 4 TLKAGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTN
 STRAIN=301 / Serotype 2a;
MEDLINE=22272406; PubMed=12384590;
Jin Q., Yuan Z., Xu J., Wang Y., Shen Y., Lu W., Wang J., Liu H.,
Yang J., Yang F., Zhang X., Zhang J., Yang G., Wu H., Qu D., Dong J.,
Sun L., Xue Y., Zhao A., Gao Y., Zhu J., Kan B., Ding K., Chen S.,
Cheng H., Yao Z., He B., Chen R., Ma D., Qiang B., Wen Y., Hou Y.,
 Tominaga A., Mahmoud M.A.-H., Mukaihara T., Enomoto M.; "Molecular characterization of intact, but cryptic, flagellin genes
 39;
 DB 1; Length 550;
 Indels
 550 AA; 56636 MW; CC921C9A8EF200B6 CRC64;
 172 AKEVIDAVNK------AGWRMKTTTANGQTGQA 198
 LDEAISSIDKFRSSLGAVONRLDSAVTNLNNTTTNLSEAQS
 96;
 01-FEB-1994 (Rel. 28, Created)
01-FEB-1995 (Rel. 31, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Hypothetical protein F59B2.12 in chromosome III.
 9.9%; Score 100.5; D 25.8%; Pred. No. 5.4;
 A
 29; Mismatches
 EMBL; D16819; BAA04093.1; -.
EMBL; AE015215; AAN43516.1; -.
PIR; S44980; S44980.
InterPro; IPR001029; Flagellin.C.
InterPro; IPR001492; Flagellin.N.
Pfam; PF00700; Flagellin.C; 1.
Pfam; PF00669; Flagellin.N; 1.
PRINTS; PR00207; FLAGELLIN.
 MEDLINE=94335647; PubMed-8057852;
 Mol. Microbiol. 12:277-285(1994).
 Conservative
 STANDARD;
 in the genus Shigella.
 Similarity
 [2]
SEQUENCE FROM N.A.
STRAIN-IID642
 YMJB_CAEEL
 Flagella.
SEQUENCE
 Query Match
 Local
 EPPP
```

```
YC00_MYCPN
Q50288;
 Query Match
 SIGNAL
 YCOO_MYCPN
 δà
 q
 δ
 q
 οy
 В
 δλ
 g
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 DFESNLESLKNADGTSMSNSTGNFNNTSYDK----ATAEEVMSKKNVNADGTSSMEASHA 337
 178 RSAALDEGNEFVNOONADGTFLRNNTGHKNTDEHLSHNVLDENAOMSIGADGTSHNITNR 237
 238 KGSVGDSHNAASD-----AHSNFESLDAQG----NKKSQNYSKKAASASGSNA 281
 141 SV-----IKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEV------IDAVNK 181
 48
 STRAIN-Bristol N2;
MEDLINE-94150718; PubMed=7906398;
Milson R., Alnoscough R., Anderson K., Baynes C., Berks M.,
Bonfield J., Button J., Connell M., Copsey T., Cooper J., Coulson A.,
Craxton M., Dear S., Du Z., Durbin R., Favello A., Fraser A.,
Fulton L., Gardner A., Green P., Hawkins T., Hillier L., Jier M.,
Johnston L., Jones M., Kershaw J., Kirsten J., Laisster N.,
Latreille P., Lightning J., Lloyd C., Mortimore B., O'Callaghan M.,
Parsons J., Percy C., Rifken L., Roopra A., Saunders D., Shownkeen R.,
Sims M., Smaldon N., Smith A., Smith M., Sonnhammer E., Staden R.,
Waterston R., Watson A., Weinstock L., Wilkinson-Sproat J.,
Wohldman P.,
 6 KAGDNLKIKQFTYSL-----KKDLTDLTSVGTEKLS------FSANGNKVNITS
 DTKGLN-------FAKETAG-------TNGDTTVHLNGIGSTLTDR
 81 AASVKDVLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT
 Eukaryota; Metazoa; Nematoda; Chromadorea; Rhabditida; Rhabditoidea;
Rhabditidae; Peloderinae; Caenorhabditis.
NCBL_TaxID=6239;
 84; Gaps
 "2.2 Mb of contiguous nucleotide sequence from chromosome III of C.
 DB 1; Length 918;
 84; Indels
 WormPep; F59B2.12; CE01024.
Hypothetical protein.
SEQUENCE 918 AA; 96560 MW; E464FD86B14945DE CRC64;
 16-00T-2001 (Rel. 40, Created)
16-0CT-2001 (Rel. 40, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
 1005 AA.
 9.7%; Score 99; DB : 21.3%; Pred. No. 12; iive 32; Mismatches
 PRT;
 EMBL; Z11505; CAA77581.1; -. PIR; G88545; G88545.
 182 AGWRMKTTTANGQT 195
 | :|:|:
| SNSSKINSASGQS 351
 Query Match
Best Local Similarity 21.39
Matches 54; Conservative
 STANDARD;
 Protein CT456 precursor.
CT456.
Chlamydia trachomatis.
 Nature 368:32-38(1994).
 Caenorhabditis elegans.
 Y456_CHLTR
 118
 49
 elegans.
 RESULT 7
Y456_CHLTR
g
 g
 ð
 a
 ò
 ò
 a
 ò
 ò
 g
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 ---KGENGSSTDEGEGLVTA 172
 600 SSSGDDSGSVSSSESDKNASVGNDGPAMKDILSAVRKHLDVVYPGENGGST---EGPLPA 656
 STRAIN=ATCC 29342 / M129;
MEDLINE=96177562; PubMed=8604303;
Hilbert H... Himmelreich R... Plagens H.. Herrmann R.;
"Sequence analysis of 56 kb from the genome of the bacterium
"Sequence comprising the dnaA region, the atp operon and a mycoplasma pneumoniae comprising the dnaA region, the atp operon and a cluster of ribosomal protein genes.";
Nucleic Acids Res. 24:628-639(1996).
 Stephens R.S., Kalman S., Lammel C.J., Fan J., Marathe R., Aravind L., Mitchell W.P., Olinger L., Tatusov R.L., Zhao Q., Koonin E.V.,
 99 ----NVDFVRTYDTVEFLSADT------KTTTVNVESKD-----NG--KKTE
 41 GNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDRAASVKDVLNAGWNIKGVK--
 540 IGDTNVNTTNTTPTTQSTDASTDTSDIDDINTNNQTDDINTTDKDSDGAGGVNGDISETE
 Gaps
 Davis R.W.;
"Genome sequence of an obligate intracellular pathogen of humans:
 68;
 Chlamydia trachomatis.";
Science 282:754-759(1998).
-!- SIMILARITY: BELONGS TO THE CHLAMYDIAL CPN0572/CT456/TC0741
FAMILY:
 Bacteria; Firmicutes; Mollicutes; Mycoplasmataceae; Mycoplasma
Bacteria; Chlamydiae; Chlamydiales; Chlamydiaceae; Chlamydia.
 DB 1; Length 1005;
 71; Indels
 SEQUENCE 1005 AA; 102131 MW; EC47EC389851CD1E CRC64;
 16-0cT-2001 (Rel. 40, Created)
16-0cT-2001 (Rel. 40, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
Hypothetical lipoprotein MPN200 precursor (GT9_orf798).
 173 KEVI-----DAVNKAGWRMKTTTANGQTGQAD 199
 22.6%; Pred. No. 13;
Live 25; Mismatches
 PROTEIN CT456
 9.7%; Score 99;
 POTENTIAL
 134 VKIGAKTSVI--KEKDGKLVTGKD----
 STRAIN=D/UW-3/Cx;
MEDLINE=99000809; Pubmed=9784136;
 EMBL; AE001319; AAC68056.1; -. PIR; C71513; C71513. PHCI-2DPAGE; 084462; -.
 Signal; Complete proteome.
 Best_Local Similarity 22.6
Matches 48; Conservative
 STANDARD;
 1005
 MPN200 OR MP631.
Mycoplasma pneumoniae.
 SEQUENCE FROM N.A.
 NCBI_TaxID=2104;
```

11;

Ŋ

```
NCBI_TaxID=83558;
 SIGNAL
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the BMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 6
 443
 67 TVHLNGIGSTLTD-----RAASVKDVLNAGWNIKGVKNVDFVRTYDTVEFLSADTKTTT 120
 99
 7 AGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDT
 386 -LYVNKGGSYSSNFOKFHQLAYSISSTSGFAYSFAGONSKRFKFT-DDGTFVEYPSYTTE
 121 VNVESKDNG-------DGKLVTGKD
 144 VNAPESNNGNDGKQQGQSDQGNLLGTFEVVDKSTSDIKVKPKTQAESKKSSDSKQTANTG
 156 KGENGSS------TDEGEG----LVTAKEVIDAVNKAGWRMKTTTANGOTG
 "Complete sequence analysis of the genome of the bacterium Mycoplasma
 PMP7_CHLDN STANDARD; PRT; 936 AA.

092898; 095542; 092504;
16-0CT-2001 (Rel. 40, Created)
16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
Probable outer membrane protein pmp7 precursor (Polymorphic membrane protein 12).
PMP7 OR OMP12 OR CPN044 OR CPD0308.
Chlamydia pneumoniae (Chlamydophila pneumoniae).
Bacteria; Chlamydiae; Chlamydiales; Chlamydiaceae; Chlamydophila.
 Nucleic Acids Res. 24:4420-4449(1996).
 Gaps
 HYPOTHETICAL LIPOPROTEIN MPN200.
N-ACYL DIGLYCERIDE (POTENTIAL).
3E2471D7EF0A3CA0 CRC64;
 DB 1; Length 798;
 SEQUENCE FROM N.A.
STRAIN-ARCZ 9342 / M129;
MEDLINE-97105885; Pubmed-8948633;
Himmelreich R., Hilbert H., Plagens H., Pirkl E., Li B.-C.,
 95; Indels
 PIR; S62791; S62791.
InterPro: IPR004890; Lipoprotein_10.
InterPro: IPR004984; Lipoprotein_X.
InterPro: IPR004984; Lipoprotein_X.
InterPro: IPR004984; Lipoprotein_0; I.
Pfam: PF03302; Lipoprotein_10; I.
PR0SITE: PS00013; PR0KAR_LIPOPROTEIN; I.
Complete proteome.
 (Potential).
SIMILARITY: BELONGS TO THE MG185 / MG260 FAMILY.
 9.7%; Score 98.5; Dilarity 21.1%; Pred. No. 11; Conservative 33; Mismatches
 POTENTIAL.
 23 798
23 23 N-7
798 AA; 87628 MW;
 AE000060; AAB96279.1; -.
 EMBL; U34795; AAC43681.1; -.
 Similarity
51; Conserv
 197 QA 198
 SA 565
 pneumoniae.
 564
 SEQUENCE
 Query Match
 Local
 SIGNAL
 PMP7_CHLPN
 Matches
 g
 ò
 g
 g
 ò
 g
 ò
 g
 ò
```

```
between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 This SWISS-PROT entry is copyright. It is produced through a collaboration
 Read T.D., Brunham R.C., Shen C., Gill S.R., Heidelberg J.F.,
White O., Hickey E.K., Peterson J., Utterback T., Berry K., Bass S.,
Linher K., Weidman J., Khouri H., Craven B., Bowman C., Dodson R.,
Gwinn M., Nelson W., DeBoy R., Kolonay J., McClarty G., Salzberg S.L.,
Eisen J., Fraser C.M.;
"Genome sequences of Chlamydia trachomatis MoPn and Chlamydia
 Christiansen G., Bossen T., Hjerno K., Daugaard L., Mygind P., Madsen A.S., Knudsen K., Falk E., Birkelund S.; "Molecular biology of Chlamydia pneumoniae surface proteins and their role in immunopathogenicity."; Am. Heart J. 138:5491-5495(1999).
 STRAIN-J138;
MEDLINE=20330349; PubMed=10871362;
Shirai M., Hirakawa H., Kimoto M., Tabuchi M., Kishi F., Ouchi K.,
Shirai T., Ishii K., Hattori M., Kuhara S., Nakazawa T.;
"Comparison of whole genome sequences of Chlamydia pneumoniae J138
from Japan and CWL029 from USA.";
Nucleic Acids Res. 28:2311-2314(2000).
 Kalman S., Mitchell W., Marathe R., Lammel C., Fan J., Hyman R.W., Olinger L., Grimwood J., Davis R.W., Stephens R.S.; "Comparative genomes of Chlamydia pneumoniae and C. trachomatis.";
 (POTENTIAL).
 936 PROBABLE OUTER MEMBRANE PROTEIN
6566 PPRHGERHI -> BDIRKTRHN (IN REF.
822 Y -> H (IN REF. 1 AND 4).
100105 MW; 3981DB3C950AF955 CRC64;
 TIGRFAMS; TIGR01414; autotrans_barl; 1.
TIGRFAMS; TIGR01376; POMP_repeat; 6. '
Outer membrane; Signal; Multigene family; Complete proteome.
 POTENTIAL.
 pneumoniae AR39.";
Nucleic Acids Res. 28:1397-1406(2000).
 InterPro; IPR005546; Autotransporter.
InterPro; IPR003368; Chlamydia_PMP.
Pfam; PF03797; Autotransporter; 1
Pfam; PF02415; DUF145; 2
 InterPro; IPR006315; Autotransport.
STRAIN=CWL029;
MEDLINE-99206606; PubMed-10192388;
 MEDLINE-20150255; PubMed-10684935;
 MEDLINE=20007584; PubMed=10539856;
 EMBL; AE001627; AAD18589.1; --
EMBL; AE002193; AAF38165.1; --
EMBL, AP002546; BAA98653.1; --
PIR; B81591; B81591.
PIR; C72078; C72078.
PIR; C86546; C86546.
PHCL 2DPAGE; Q92898; --
TIGR; CP03098; --
 SEQUENCE OF 658-936 FROM N.A.
 Nat. Genet. 21:385-389(1999).
 24 9
658 6
822 8
936 AA;
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 STRAIN-AR39
 CHAIN
CONFLICT
CONFLICT
SEQUENCE
```

PIR; A36924; A36924.

6 12:39:18 2003

Mon Oct

```
13;
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
 274 VILTGNKNLSFTNNTALTYGGAISGLKVSISAGGPTLFQSNISGSSAGQGGGGAINIASA 333
 62 -----TNGDTTVHLNGI--GSTLTDRAASVKDVLNAGWNIKGVKNVDFVRTYDTVEFL 112
 391
 452 LRDGVTVTFKDLTQSPGSRILMDGGTTLSAKEANLSLNGLAVNLSSLDGTNKAA--LKTE 509
 61
 -KDGKLVTGKDKGENGSS--TDEGEGLVTAKEV-----IDAVNKAGWRMKTT
 MEDLINE=94012467; PubMed=8407780;
Boot H.J., Kolen C.P.A.M., van Noort J.M., Pouwels P.H.;
"S-layer protein of Lactobacillus acidophilus ATCC 4356:
purification, expression in Escherichia coli, and nucleotide sequence
of the corresponding gene.";
 27 LTSVGTEKLSFSAN----GNKVNITSDTKGL---NFAKETAG------
 Gaps
 81;
 01-JUN-1994 (Rel. 29, Created)
01-JUN-1994 (Rel. 29, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation update)
S-layer protein precursor (Surface layer protein) (SA-protein).
 113 SADTKTTTVNVESKD--------NGKK---TEVKIGAK-TSVIKE--
 Length 936;
 71; Indels
 Lactobacillus acidophilus.
Bacteria; Firmicutes; Lactobacillales; Lactobacillaceae;
Lactobacillus.
 [1]
SEQUENCE FROM N.A., AND SEQUENCE OF 343-351 AND 440-444
 DB 1;
 444 AA.
 32; Mismatches
 Score 98.5;
Pred. No. 13;
 PRT;
 STRAIN=ATCC 4356;
MEDLINE=96099308; PubMed=8522531;
 9.7%;
 EMBL; X71412; CAA50535.1; -. EMBL; X89375; CAA61560.1; -.
 59; Conservative
 STANDARD;
Query Match
Best Local Similarity
 SEQUENCE FROM N.A.
 STRAIN-ATCC 4356;
 190 TAN 192
 NCBI_TaxID=1579;
 SLAP_LACAC
P35829;
 392
 SLAP_LACAC
 Matches
 RESULT 10
 셤
 δ
 δλ
 g
 q
 ò
 g
 g
 ŏ
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 203 YDVTSGATVTNGAVSVNADNQGQVNVANVVAAINSKYFAAQYADKKLNTRTANTEDAIKA 262
 91 GWNIK--GVKNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDG 148
 315 ASVSKRIMHNAYYYDKDAKRVGTDS------VKRYNSVSVLPNTTINGKTYYQVV 364
 7 AGDNLKIKQFTYSLKKDLTDLTSVGTEKLSFSANG----NKVNI-----TSDTKGLNF 55
 56 AKETAG---TNGDTTVHLNGIGST-------LTDRAASVKDVLNA
 263 ALKDQKIDVNSVGY-----FKAPHTFTVNVKATSNTNGKSATLPVVVTVPNVAEPTV
 76; Gaps
 J. Bacteriol. 175:5359-5365(1993).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
-!- MISCELLAHGOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE BETWEEN THE PRODUCTION OF 2 ANTIGENIC FORMS OF FLAGELLA, TERMED PHASE-1 AND PHASE-2, EACH SPECIFIED BY SEPARATE STRUCTURAL GENES.
-!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
 149 KLVTGK-----DKGENGSSTDEGECLVTAKEVIDAVNKAGWRMKTTTANGQT
 Masten B.J., Joys T.M.; "Molecular analyses of the Salmonella g. . . flagellar antigen
 Length 444;
 Indels
 25 444 S-LAYER PROTEIN.
444 AA; 46570 MW; 2090732F89099161 CRC64;
 9.6%; Score 98; DB 1;
22.9%; Pred. No. 6.3;
tive 29; Mismatches 87
 01-00T-1996 (Rel. 34, Created)
01-00T-1996 (Rel. 34, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
Flagellin (Phase-1-D flagellin).
 504 AA
 InterPro; IPR004903; SLAP.
Pfam; PF03217; SLAP; 1.
Signal; Glycoprotein; Cell wall; S-layer.
 POTENTIAL.
 PRT;
 STRAIN=CDC;
MEDLINE=93374829; PubMed=7690024;
 PIR; S33191; S33191.
InterPro; IPR001029; Flagellin_C.
InterPro; IPR001492; FlagellinN.
 EMBL; Z15086; CAA78794.1; -.
 Query Match
Best Local Similarity 22.98
Matches 57; Conservative
 STANDARD;
 196 --GQA-DKF 201
 365 ENGKAVDKY 373
 SEQUENCE FROM N.A.
 Salmonella moscow.
 NCBI_TaxID=28146;
 FLIC_SALMC
 SEQUENCE
 complex."
 SIGNAL
 RESULT 11
FLIC_SALMC
DR
DR
DR
KW
KW
SQ
SQ
 q
 g
 qq
 δλ
 q
 δλ
 δ
 δ
 q
```

^

```
WAPA_BACSU
 g
 q
 ŏ
 ò
 ŏ
 셤
 ò
 g
 8
 DRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSADTKTTTVNVESKD----NGKK 131
 ----VADIATGATNVNAATLQSSKNVYTSVVNGQF-TFDDKTKNESAKLSDLEANNAVK 362
 TDLTSVGT---EKLSFSANGNKVNITSDTKGLNFAKETA---GTNGDTTVHLNGIGSTLT 78
 | 23

SEQUENCE FROM N.A.

STRAIN-LIZ / SGSC1412 / ATCC 700720;

STRAIN-LIZ / SGSC1412 / ATCC 700720;

MCLelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P.,

MCClelland M., Sanderson K.E., Spieth J., Clifton S.W., Layman D.,

COUTHOY L., PorwOllik S., Ali J., Dante M., Du F., Hou S., Layman D.,

Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulvaney E.,

Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M.
 MISCELLANEOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE BETWEEN THE PRODUCTION OF 2 ANTIGENIC FORMS OF FLAGELLA, TERMED
 *Complete genome sequence of Salmonella enterica serovar Typhimurium
 Mingorance J., Tanaka S., Tominaga A., Enomoto M.;
Submitted (JAN-1994) to the EMBL/Genbank/DBJ databases.
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO
PORM THE FILAMENTS OF BACTERIAL FLAGELLA.
 Salmonella typhimurium.
Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
 | || || || : : || || : || || : || || 363 GESKITVNGAEYTANATGDKITLAGKTMFIDKTASGVSTLINEDAAAAKK 412
 TEVKI --- GAKTSVIKEKDGKLVTGK ---- DKGENGSSTDEGEGLVTAKE 174
 26;
 Silverman M., Zieg J., Mandel G., Simon M.; "Analysis of the functional components of the phase variation
 Vanegas R.A., Joys T.M.;
"Molecular analyses of the phase-2 antigen complex 1,2,. . of
 9.5%; Score 97; DB 1; Length 504; ilarity 27.6%; Pred. No. 8.5; Conservative 22; Mismatches 75; Indels
 BY SIMILARITY.
FCAEA2180AF111A0 CRC64;
 Cold Spring Harb. Symp. Quant. Biol. 45:17-26(1981)
 FLJB_SALTY STANDARD; PRT; 505 AA. P52616; P97159; PREJ. 34, Created) 01-0CT-1996 (Rel. 34, Last sequence update) 28-FEE-2003 (Rel. 41, Last annotation update)
 Bacteriol. 177:3863-3864(1995).
 SEQUENCE OF 1-37 FROM N.A.
MEDLINE-82049491; Pubmed-6271461;
 STRAIN-SL 375;
MEDLINE-95325331; PubMed-7541401;
 Enterobacteriaceae; Salmonella.
NCBI_TaxID=602;
Pfam; PF00700; Flagellin_C; 1. Pfam; PF00669; Flagellin_N; 1. PRINTS; PR00207; FLAGELLIN.
 0 0 B
504 AA; 52791 MW;
 SEQUENCE OF 482-505 FROM N.A.
 Nature 413:852-856(2001).
 Phase-2 flagellin.
FLJB OR H2 OR STM2771.
 l Similarity
47; Conserva
 SEQUENCE FROM N.A.
 Salmonella spp.
 STRAIN-SJ2353;
 INIT_MET
SEQUENCE
 Flagella.
 19
 Query Match
 25
 309
 Local
 Matches
 RESULT 12
 DR
DR
FT
SQ
 g
 셤
 ò
 g
 ò
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the BMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 89 NAGWNIKGVKNVDFVRTYDTVEFLSADTKTTTV--NVESKDNGKKTEVKIGAKTSVIKEK 146
 147 DGKLVTGKDKGENG----SSTDEGEGLVTAKEVI------DAVNKAG---WRMKTT 189
 274 PAGATTK----TEVQELKDTPAVVSADAKNALIAGGVDATDANGAELVKMS----YTDK 324
 :|| : | : | : | : : 325 NGKTIEGGYALKAGDKYYAADYDEATGAIKAKTTSYTAADGTTKTAANQLGGVDGKTEVV 384
 88
 29 SVGTEKLSFSANGNKVNITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTDRAASVKDVL
PHASE-1 AND PHASE-2, EACH SPECIFIED BY SEPARATE STRUCTURAL GENES.
 Gaps
 "Molecular analysis of three major wall-associated proteins of
Bacillus subtilis 168: evidence for processing of the product of a
gene encoding a 258 kDa precursor two-domain ligand-binding
 33;
 Length 505;
 Indels
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus.
 BY SIMILARITY.
I -> S (IN REF. 3).
; 3A5CC404AF7AF88B CRC64;
 84;
 DB 1;
 01-OCT-1994 (Rel. 30, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update)
 9.5%; Score 96.5; DE
25.7%; Pred. No. 9.2;
1ve. 25; Mismatches
 Stydene; SG10054; filb.

InterPro; IPR001029; Flagellin_C.

InterPro; IPR001492; Flagellin_C.

Pfam; PF00700; Plagellin_C; I.

Pfam; PR00669; Flagellin_N; I.

PRINTS; PR00207; FLAGELLIN.

Probom; PD000316; Flagellin_C; Z.

Flagella; Complete protecome.
 Wall-associated protein precursor. WAPA OR N17G.
 STRAIN=168;
MEDLINE=93302506; PubMed=8316082;
 Mol. Microbiol. 8:299-310(1993).
 EMBL; U17177; AAC43354.1; -.
EMBL; AE008826; AAL21657.1; -.
EMBL; V01370; CAA24655.1; -.
EMBL; D26168; BAA05156.1; -.
 01-OCT-1994 (Rel. 30, Created)
 37 37 I
505 AA; 52404 MW;
 Query Match 9.5%
Best Local Similarity 25.7%
Matches 49; Conservative
 | :|:| | |
385 TIDGKTYNASK 395
 190 TANGQTGQADK 200
 STANDARD;
 SEQUENCE FROM N.A. STRAIN=168 / BGSC1A1;
 SEQUENCE FROM N.A.
 Bacillus subtilis
 NCBI_TaxID=1423;
 Foster S.J.;
 WAPA_BACSU
 INIT_MET
CONFLICT
 SEQUENCE
 rotein.
```

ထ

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (see http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 KARAIN-LE-9804433; PubMed-9384377;

K WEDLINE-98044033; PubMed-9384377;

RA Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G.,

RA Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,

RA Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,

RA Bronillet S., Eruschi C.V., Caldwell B., Capuano V., Carter N.M.,

RA Bronillet S., Erington J.J., Connerton I.F., Cummings N.J., Daniel R.A.,

RA Chid S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,

RA Britz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N.,

RA Fitz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N.,

RA Gliseppi G., Guy B.J., Haga K., Haicoh J., Harwood C.R., Hanut A.,

RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,

RA Kusta K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,

RA Kutita K., Lapidus A., Liu H., Masuda S., Mauel C., Mediue C.,

RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

RA Noone D., O'Reilly M., Ogawa K., Odiwara A., Oudega B., Park S.H.,

RA Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S.,

RA Rieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,

RA Setiguchi J., Sekowska A., Seror S.J., Serror P., Shin B. S., Soldo B.,

RA Sorokin A., Tanakoshi A., Tanaka T., Terpstra P., Tognoni A.,

RA Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Tognoni A.,

RA Visari A. Wammint P. Wanler F. Wanler F. Wannier F., Wannier F.,

RA Visari M. Wammint P. Wanler F. Wannier F., Wannier F.,

RA Visari M. Wammint F. Wanler F. Wannier F., Wannier F.,

RA Visari M., Wammint F. Wanler F. Wannier F., Wannier F.,

RA Visari M., Wammint F. Wanler F. Wannier F.,

RA Visari M., Wammint F. Wannier F., Wannier F.,

RA Visari M., Wammint F. Wannier F., Wannier F.,

RA Visari M., Wammint F. Wannier F., Wannier F.,

RA Visari M., Wannier F., Wannier F., Wannier F.,

RA Visari M., Wannier F., Wannier F., Wannier F.,

RA Visari M., Wannier F.,

RA Visari M., Wannier F.,

RA Visari M., Wannier M., Wannier M.,
 101 AA REPEATS WHICH ARE RESPONSIBLE FOR CELL WALL BINDING; THE C-TERMINUS CONSTRAS OF TWO BLOCKS OF RESIDUES WITH A CONSERVED MOTIF REPEATED 31 TIMES.
SIMILARITY: THE REPEATED MOTIF IN THE C-TERMINUS HAS SOME SIMILARITY TO THE REPEAT IN E.COLI RHS GROUP OF PROTEINS (RHSA-D).
 FUNCTION: STILL UNKNOWN. NOT INVOLVED IN CELL MEMBRANE METABOLISM, MOTILITY, SECRETION OR DIFFERENTIATION.
 Viari A., Wambutt R., Wedler E., Wedler H., Weitzenegger T., Winters P., Wipat A., Yamamoto H., Yamane K., Yasumoto K., Yata K., Yoshidawa H.F., Zumstein E., Yoshikawa H., Danchin A.; "The complete genome sequence of the Gram-positive bacterium Bacillus subtilis."
 DOMAIN: HAS TWO LIGAND-BINDING DOMAINS; THE N-TERMINUS, HAS THREE
 Yoshida K.-I., Sano H., Seki S., Oda M., Fujimura M., Fujita Y., "Cloning and sequencing of a 29 kb region of the Bacillus subtilis genome containing the hut and wapA loci.";
Microbiology 141:337-343(1995).
 Yoshida K. I., Shindo K., Sano H., Seki S., Fujimura M., Yanai N. Miwa Y., Fujita Y.;
"Sequencing of a 65 kb region of the Bacillus subtilis genome containing the lic and cell loci, and creation of a 177 kb contig covering the gnt-sacXY region.";
Microbiology 142:3113-3123(1996).
 SUBCELLULAR LOCATION: MEMBRANE-ASSOCIATED. MAY BE RELEASED INTO THE MEDIUM.
MEDLINE=95219088; PubMed=7704263;
 STRAIN=168 / BGSC1A1;
MEDLINE=97124196; PubMed=8969509;
 EMBL; L05634; AAA22883.1; -. EMBL; D31895; BAA06656.1; -. EMBL; D29985; BAA06260.1; -. EMBL; D83026; BAA11683.1; -.
 Nature 390:249-256(1997).
 SEQUENCE FROM N.A.
 FROM N.A.
 SEQUENCE
```

```
|: | || :| :| || :| || 1929 ---THEDGTVIEYTYDGFGNRKT--VTTIKDGSSKTVNASFNIMNQLTKVNDESISYDKN 1983
 2044 LNVLYETDADNNVTKSYTYGDSGQLLSYTENGKKYFYHYNAHGDIIAISDSTGKTVAKYQ 2103
 96 GVKNVD--FVRTYDTVEFLSADTKT-----TTVNVESKD-----NGKKTEVKI-GAK 139
 140 TSVIKEKDG-----GLVTGKDKGENGSSTDEGE------------------------GLVTAKEV 175
 28
 1-3.
31 x 21 AA APPROXIMATE TANDEM REPEATS OF X(4)-G-X(4)-[YF]-X-D-X(2)-G-X(4).
 16 FTYSLKKDLTDLTSVG-----TEKLSFSANGNKVNITSDTKG-----LN-FAKE
 Gaps
 OR 32 (POTENTIAL).
WALL-ASSOCIATED PROTEIN.
3 X 101 AA APPROXIMATE TANDEM REPEATS.
 91;
 DB 1; Length 2334;
 Indels
 B75138CCD278BAA3 CRC64;
 59 TAGINGDITV---HLNGIGSTLIDRAASVKD----VLNAGWNI-
 16;
 (APPROXIMATE)
EMBL; Z99124; CAB15959.1; -.
PIR; S322920; S32220.
Subtilist; BG10797; wapA.
InterPro; IPR003305; CBM_CenC.
InterPro; IPR00530; YD.
Pfam; PF02018; CBM_4-9; 1.
CG11 Wall; Repeat; Signal; Complete proteome.
 9.5%; Score 96.5; I
!5.1%; Pred. No. 52;
.ve 24; Mismatches
 2071 2090 2-29.
2093 2112 2-30.
2120 2139 2-31.
2334 AA; 258329 MW; E
 2-4.
2-5.
2-5.
2-6.
2-9.
2-10.
2-112.
2-114.
2-115.
2-116.
2-116.
2-116.
 2104 YDA-----WGNPTKT 2113
 176 IDAVNKAGWRMKTTT 190
 Conservative
 869
605
736
869
2139
 1814
1839
1859
1880
1906
 1665
1686
1709
 1730
1751
1772
 1169
 Similarity
 29
504
504
636
 021
 64;
 Query Match
 SEQUENCE
 Local
 REPEAT
REPEAT
REPEAT
DOMAIN
 REPEAT
REPEAT
REPEAT
 REPEAT
REPEAT
REPEAT
 REPEAT
REPEAT
 REPEAT
REPEAT
 REPEAT
REPEAT
 SIGNAL
 DOMAIN
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 REPEAT
 CHAIN
 Matches
 DORRED E FETT E
 g
 δŏ
 a
 δy
 g
 δ
 g
 ŏ
```

```
DD BRYKKEN BENEFIT OF STANFORM δλ
 pp
 ò
 g
 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modifited and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 11;
 --DRAASVKDVLNAGWNIKGVKNVDFVRTYDTV---EFLSADTKTTTVNVESKD----NG 129
 309 VADIATGATDV-NAA-TLOSSKNV----YTSVVNGQF-TFDDKTKNESAKLSDLEANNA 360
 249 TTKSAAGTDEAKAIAGAIKGGKEGDTFDYKGVTFTIDTKTGDDGNGKVSTTINGEKVTLT 308
 25 TDLTSVGTEK---LSFSANGNKVNITSDTKGLNFAKETA---GTNGDTTVHLNGIGSTLT 78
 1. Bacteriol. 175:5359-5365(1993).
-!- FUNCTION: FLAGELLIN IS THE SUBUNIT PROTEIN WHICH POLYMERIZES TO FORM THE FILAMENTS OF BACTERIAL FLAGELLA.
-!- MISCELLANEOUS: INDIVIDUAL SALMONELLA SEROTYPES USUALLY ALTERNATE BETWEEN THE PRODUCTION OF 2 ANTIGENIC FORMS OF FLAGELLA, TERMED PHASE-1 AND PHASE-2, EACH SPECIFIED BY SEPARATE STRUCTURAL GENES-!- SIMILARITY: BELONGS TO THE BACTERIAL FLAGELLIN FAMILY.
 Gaps
 130 KKTEVKI---GAKTSVIKEKDGKLVTGK----DKGENGSSTDEGEGLVTAKE 174
 Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
Enterobacteriaceae; Salmonella.
 30;
 . . flagellar antigen
 9.4%; Score 96; DB 1; Length 504; 30.2%; Pred. No. 10;
 67; Indels
 BY SIMILARITY.
5C090577F21ECA67 CRC64;
 , Last sequence update), Last annotation update)
 504 AA.
 ; Pred. No. 10;
23; Mismatches
 Masten B.J., Joys T.M.;
"Molecular analyses of the Salmonella g.
 STRAIN-ATCC 8387;
MEDLINE-93374829; PubMed-7690024;
 PIR; S33190; S33190.
InterPro; IPR001029; Flagellin_C.
InterPro; IPR001492; FlagellinN.
 01-0CT-1996 (Rel. 34, Created)
1-0CT-1996 (Rel. 34, Last seque)
30-MAY-2000 (Rel. 39, Last annotter)
Flagellin (Phase-1-C flagellin).
 Pfam; PF00700; Flagellin_C; 1.
Pfam; PF00669; Flagellin_N; 1.
PRINTS; PR00207; FLAGELLIN.
 0 0 E
504 AA; 52862 MW;
 EMBL; Z15069; CAA78778.1; -.
 30.2%;
 Similarity 30.29 52; Conservative
 STANDARD;
 Salmonella montevideo.
 SEQUENCE FROM N.A.
 NCBI_TaxID=115981;
 FLIC_SALMO
Q06973;
 INIT_MET
SEQUENCE
 Flagella.
 79
 Match
 complex.
 Local
 RESULT 14
FLIC_SALMO
 RESULT 15
RPOB_MYCGE
 Matches
 Query
 g
 ò
 ò
 셤
 E P P P P P
 à
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
 12;
 -----TNGDTTVHLNGIG------STLTDRAASVKDVLNAGWNIKGVKNVDFVRT 105
 469 TIDVYITNDNLSVSVPVIGIHNENDLNKAMTLSDFIASISYVINLPYGI------GK 519
 LKDG-KLLLKKGTLLLKEEIDKIKQAAKNNEISFV---NKMQLTTDGKAVDLAKESLFYE 468
 61
 SEQUENCE FROM N.A.

STRAIN-ATCC 33530 / G-37;

STRAIN-ATCC 33530 / G-37;

Fraser C.M., Gocayne J.D., White O., Adams M.D., Clayton R.A.,

Fleischman D.L., Bull C.J., Kerlavage A.R., Sandton G., Kelley J.M.,

Fritchman J.L., Weidman J.F., Small K.V., Sandton G., Kelley J.M.,

Fritchman J.L., Weidman J.F., Sandek D.M., Phillips C.A., Merrick J.M.,

Tomb J.-F., Dougherty B.A., Bott K.F., Hu P.-C., Lucier T.S.,

Peterson S.N., Smith H.O., Hutchison C.A. III, Venter J.C.;

"The minimal gene complement of Mycoplasma genitalium.";
 -i - FUNCTION: DNA-DEPENDENT RNA POLYMERASE CATALYZES THE TRANSCRIPTION
 LKAGDNLKIKQFTYSLKKDLTDLTSVG-TEKLSFSANGNKVNITSDTKGLNFAKETAG--
 46; Gaps
 -!- SUBUNIT: THE ENZYME CONSISTS OF THE SIGMA CHAIN AND THE CORE ENZYME WHICH IS COMPOSED OF 2 ALPHA CHAINS, 1 BETA CHAIN, AND 1
 -!- CATALYTIC ACTIVITY: N nucleoside triphosphate = N diphosphate +
 OF DNA INTO RNA USING THE FOUR RIBONUCLEOSIDE TRIPHOSPHATES AS
 SIMILARITY: Belongs to the RNA polymerase beta chain family.
 Mycoplasma genitalium.
Bacteria; Firmicutes; Mollicutes; Mycoplasmataceae; Mycoplasma
 Peterson S.N., Hu P.-C., Bott K.F., Hutchison C.A. III; "A survey of the Mycoplasma genitalium genome by using random
 Length 1390;
 65; Indels
 1062 1062 H -> L (IN REF. 2).
1390 AA; 156330 MW; 4D1888A07680912C CRC64;
 Transferase, Transcription; DNA-directed RNA polymerase;
 DB 1;
37;
 9.3%; Score 95; DB 1
25.0%; Pred. No. 37;
Live 39; Mismatches
chain) (RNA polymerase beta subunit). OR MG341.
 SEQUENCE OF 533-644 AND 945-1067 FROM N.A.
 luencing.";
Bacteriol. 175:7918-7930(1993).
 Pfam; PF04563; RNA_pol_Rpb2_1; 1.
Pfam; PF04561; RNA_pol_Rpb2_2; 1.
Pfam; PF04565; RNA_pol_Rpb2_3; 1.
Pfam; PF04565; RNA_pol_Rpb2_6; 1.
Pfam; PF04560; RNA_pol_Rpb2_7; 1.
PROSITE; PS01166; RNA_POL_BETA; 1.
 STRAIN=ATCC 33530 / G-37;
MEDLINE=94075230; PubMed=8253680;
 InterPro; IPR001572; RNA_pol_B
 EMBL; U39715; AAC71566.1; -. EMBL; U01737; AAD10547.1; -. EMBL; U01735; AAD10545.1; -.
 Best_Local Similarity 25.09
Matches 50; Conservative
 PIR; G64237; G64237.
HSSP; Q9KWU7; 1HQM.
TIGR; MG341; -.
 Complete proteome.
 NCBI_TaxID=2097;
 BETA' CHAIN.
 SUBSTRATES
 (RNA)(N)
 sequencing.
 'n
 SEQUENCE
 Query Match
 62
```

```
qq
ò
```

160 GSSTDEGEGL-VTAKEVIDA 178
| ::| :| :|::
573 GQVIEQGEKKELTIKSLINS 592 QQ ŏ

Search completed: October 6, 2003, 09:24:21 Job time : 4.10395 secs

```
09944 neisseria m
091ps0 neisseria m
091ps0 neisseria m
091ps0 neisseria m
091ps0 neisseria m
091ps9 neisseria m
091ps9 neisseria m
091ps5 neisseria m
091ps5 neisseria m
091ps5 neisseria m
091ps5 neisseria m
091ps7 haemophilus
08m75 haemophilus
08m75 haemophilus
08m76 haemophilus
08m77 haemophilus
08m77 haemophilus
08m76 haemophilus
08m76 haemophilus
08m76 haemophilus
08m76 haemophilus
08m76 haemophilus
08m78 haemophilus
08m78 haemophilus
08m78 haemophilus
08m78 haemophilus
08m78 haemophilus
08m78 staphylococ
08kqm9 moraxella c
08kqm9 moraxella c
08kqm9 moraxella c
08cmp4 staphylococ
098x11 staphylococ
0951x5 pasteurella
053821 salmonella
051x5 pasteurella
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 neisseria
 Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157606; AAK68867.1; -.
EINTERPO; IRRO05594; YadA.
EMBL; AF157606; AAK68867.1; -.
Pfam; PF03895; YadA; 1.
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 ------RAASVKDVLNAGWNIKGV
 Gaps
 33;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales; Neisseriaceae; Neisseria.
 Indels
 01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-CCT-2002 (TrEMBLrel. 22, Last annotation update)
NhhA outer membrane protein.
 Score 957.5; DB 2;
Pred. No. 4.6e-48;
0; Mismatches 0;
 591 AA
 ALIGNMENTS
 60 AGTNGDTTVHLNGIGSTLTD------
 09JQW4
 09F3X5
 QBGM74
QBGM76
QBGM78
QBGM77
QBKQM8
 PRT;
 Q93QY4
Q9JPR9
Q9JPS0
 0930Y1
09JPI0
09JPS9
 Q8GM79
Q8GM75
 Q8CMP4
 Q54415
Q9RNI2
Q54515
 093QY2
 P71401
 048152
 053821
 0;
 94.1%;
ilarity 85.7%;
Conservative
 91
 91
 16
 PRELIMINARY;
 600
10098
10098
1210
1210
1210
1210
1204
1204
11264
11264
11264
1133
1733
1733
1733
 Neisseria meningitidis.
 Query Match
Best Local Similarity
Matches 198; Conserv
 SEQUENCE FROM N.A.
 660.7
660.7
680.5
831.6
831.6
831.6
831.6
112.0
112.0
111.6
111.6
111.6
 NCBI_TaxID=487;
 STRAIN-EG329
923.5
922.5
921.5
921.5
921.5
918.5
907.5
907.5
622.5
622.5
615.8
 203.5
199
157.5
 123.5
123.5
122.5
122.5
 118
118
116.5
116
 570
324
322
 594
 86
 Q93QY3
 RESULT 1
 D930Y3
 a
 g
 Ω
 δý
 Ogjrla neisseria m
19aqfo neisseria m
19jps3 neisseria m
 neisseria m
neisseria m
neisseria m
neisseria m
neisseria m
 093qy3 neisseria m
09jps7 neisseria m
 neisseria n
neisseria n
neisseria n
 (without alignments)
3513.485 Million cell updates/sec
 neisseria
 neisseria
 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
 October 6, 2003, 09:13:10 ; Search time 14.7627 Seconds
 US-09-771-382-39
1018
1 SANTLKAGDNLKIKQFTYSL......AGWRWKTTTANGQTGQADKF 201
 Description
 09jps3
09jpi3
09jps2
09jph0
09jps8
 09jps8
09jps8
09jps4
09jps4
09jpt0
09jpr8
09jps1
 09aqf0
 GenCore version 5.1.6
Copyright (c) 1993 - 2003 Compugen Ltd.
 Total number of hits satisfying chosen parameters:
 830525 segs, 258052604 residues
 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
 OM protein - protein search, using sw model
 Q93QY3
Q9JPS7
Q9JR18
Q9AQF0
Q9JPS3
 09JPI3
09JPS2
09JPS8
09JPS8
09JPS6
09JPS4
09JPT0
09JPR8
 BLOSUM62
Gapop 10.0 , Gapext 0.5
 Q9JPS1
Q9JPH7
 sp_unclassified:*
 sp_fungi:*
sp_human:*
sp_invertebrate:*
sp_mammal:*
 sp_vertebrate:*
 sp_rvirus:*
sp_bacteriap:*
 sp_organelle:*
sp_phage:*
 Minimum DB seq length: 0
Maximum DB seq length: 200000000
 sp_archea:*
sp_bacteria:*
 sp_archeap:*
 sp_rodent:*
sp_virus:*
 sp_plant:*
 DB
 SPTREMBL_23:*
 sp_mhc:*
 Length
 Query
 957.5
9957.5
9957.5
9957.5
9957.5
995.5
936.5
936.5
925.5
925.5
925.5
925.5
 Perfect score:
 Scoring table:
 Sequence:
 Searched:
 Database
 :
oo
 No.
```

~

```
86
 Query Match
 TIGR;
 Matches
 RESULT
Q9AQF0
 Dp
 ΩD
 Db
 ò
 δ
 δ
 qq
 229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 288
229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 288
 59
 97
 109 TLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 98 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 60 AGTINGDTTVHLNGIGSTLTD----------RAASVKDVLNAGWNIKGV
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comenducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Comenducci M., Jennings G.T., Baldi L., Bartolini E., Mora M., Nuti S., Ratti G.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hoxon D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 33;
 289 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTGQADKF
 DB 2; Length 591;
 289 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 membrane
 Neisseria meningitidis, and
Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 0; Indels
 62113 MW; 533453CAE5A91E1F CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT-2002 (TrEMBLrel. 23, Last annotation update)
01-OCT-2002 (TrEMBLrel. 23, Last annotation update)
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
 Score 957.5; DB 2
Pred. No. 4.6e-48;
 AA.
 Ą
 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
 0; Mismatches
 591
 591
 PRT;
 MEDLINE-20175756; PubMed-10710308;
 94.18;
85.78;
 EMBL; AF226366; AAF42515.1;
InterPro; IPR005594; YadA.
 protein).
GNA992 OR NMB0992 OR NHHA.
 198; Conservative
 Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 PRELIMINARY;
 PRELIMINARY;
 Neisseria meningitidis.
 Pfam; PF03895; YadA;
SEQUENCE 591 AA; (
 Query Match
Best Local Similarity
 SEQUENCE FROM N.A.
 STRAIN=B2147
 151
 Q9JR18
Q9JR18;
 09JPS7
 Matches
 RESULT 2
Q9JPS7
 RESULT 3
 Q9JR18
 20
 ò
 셤
 ŏ
 g
 ò
 g
 δ
 셤
 ò
 g
```

```
ώ,
 168
 229 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 288
 97
 MEDLINE=2017575; PubMed=1071307;
MEDLINE=2017575; PubMed=1071307;
Elsen J.A., Ketchum K.A., Heidelberg J., Jeffries A.C., Nelson K.E.,
Elsen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J.,
Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K.,
Haft D.H., Salzberg S.L., White O., Felschmann R.D., Dougherty B.A.,
Mason T., Clecko A., Parksey D.S., Blair E., Cittone H., Clark E.B.,
Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J.,
Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L.,
Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.;
"Complete genome sequence of Neisseria meningitidis serogroup B strain
 SPECIES—N. moningitidis; STRAIN—PMC21;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
Identification and characterization of a gene encoding a novel outer
membrane proctein of Netsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF226375; AAF42524.1;
EMBL, AF226375; AAF42510.1;
EMBL, AF226374; AAF42519.1;
EMBL, AF226374; AAF4253.1;
EMBL, AF226374; AAF4252.1;
EMBL, AF226374; AAF4252.1;
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 109 TLKAGDNLKIKQNGTNFTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 60 AGINGDIIVHLNGIGSTLTD-------RAASVKDVLNAGWNIKGV
 Gaps
 STRAIN-MCS8 / Serogroup B, BZ169, BZ83, and H44/76;
MEDLINE-20175756; PubMed-10710308;
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Commanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S
Ratti G., Santini L., Savinio S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
 33;
 Length 591;
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF
 Indels
 Moxon E.R., Grandi G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup
 7C22F3CAE7F73EC6 CRC64;
 DB 16;
 / Match 94.1%; Score 957.5; DB 10
Local Similarity 85.7%; Pred. No. 4.6e-48;
Nes 198; Conservative 0; Mismatches 0
 by Whole-Genome Sequencing.";
 591 AA; 62112 MW;
 Science 287:1809-1815(2000).
 Science 287:1816-1820(2000).
 InterPro; IPR005594; YadA.
Neisseriaceae; Neisseria.
 Pfam; PF03895; YadA; 1.
Complete proteome.
SEQUENCE 591 AA: 6211
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 NMB0992;
 Meningococcus
```

us-09-771-382-39.rspt

```
æ,
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 59
 97
 PERMIN-MOS8;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.;
Peak I.R., Srikhanta Y., Dieckelman M., Moxon E.R., Jennings M.P.;
"Identification and characterisation of a gene encoding a novel outer
membrane protein of Neisseria meningitidis.";
Submitted (FEB-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF125375; AAK09243.1;
InterPro; IPR005594; YadA.
InterPro; IPR005594; YadA.
Pfam: PF03895; YadA: 1.
SEQUENCE 592 AA; 62290 MW; 168986A97381EFC5 CRC64;
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 AGTNGDTTVHLNGIGSTLTD-------RGTNGDTTVHLNGIGSTLTD-
 230 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGVKTSVIKEKDGKL
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Companducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Identification of Vaccine Candidates Against Serogroup B
 33;
 DB 2; Length 592;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Indels
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
 Last sequence update)
Last annotation update)
 93.7%; Score 953.5; DB 2
85.3%; Pred. No. 7.9e-48;
live 0; Mismatches 1
 Meningococcus by Whole-Genome Sequencing.";
Science 287:1816-1820(2000).
 Ž
 592 AA
 Created)
 PRT;
 STRAIN-NGE28;
MEDLINE-20175756; PubMed-10710308;
 PRT;
 EMBL; AF226378; AAF42527.1; -.
InterPro; IPR005594; YadA.
 (TrEMBLrel. 17, C
(TrEMBLrel. 17, I
(TrEMBLrel. 22, I
 Best Local Similarity 85.3
Matches 197; Conservative
 PRELIMINARY;
 PRELIMINARY;
 Neisseria meningitidis.
 Outer membrane protein
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 NCBI_TaxID=487;
 01-JUN-2001
01-JUN-2001
01-OCT-2002
 9
 98
 Query Match
 Q9JPS3
Q9JPS3;
Q9AQFO
Q9AQFO;
 GNA992.
 RESULT 5
 09JPS3
 AC DE PAC ò
 셤
 δ
 유
 ò
 g
 ð
 q
```

```
ć,
 227 KPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKRTEVKIGAKTSVIKEKDGKL 286
 224
 225 WNIKGVKPGTTASDNVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 284
 K-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIKEKDGKL 150
 53
 91
 23
 97
 165 NFAKETAGTNGDTTVHLNGIGSTLTDTLLNTGATTNVTNDNVTDDEKKRAASVKDVLNAG
 WNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
 ------RAASVKDVLNAG
 ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL
 4 TLKAGDNLKIKQ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGLNFAKET
 -----RAASVKDVLNAGWNIKGV
 Gaps
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Maneti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffriss A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R.; Identification of Vaccine Candidates Against Serogroup B
 151 VTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 39;
 33;
 DB 2; Length 590;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Length
 Indels
 Indels
 EMBL; AF226376; AAF42525.1; -.
EMBL; AF226369; AAF42518.1; -.
INDECTPO; IPRO05594; YadA.
PÉDM; PF03895; YadA; 1.
SEQUENCE 594 AA; 62086 WW; IB25E03B90D04B46 CRC64;
 8AA476AC300D80C8 CRC64;
 (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 22, Last annotation update)
 Score 936.5; DB 2;
Pred. No. 7.7e-47;
0; Mismatches 3;
 Score 947.5; DB 2;
Pred. No. 1.8e-47;
1; Mismatches 1;
 54 NFAKETAGTNGDTTVHLNGIGSTLTD--------
 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
 Ş
 0; Mismatches
 AGTNGDTTVHLNGIGSTLTD-------
 594
 PRT;
 STRAIN=NG3/88, and BZ232;
MEDLINE=20175756; PubMed=10710308;
PF03895; YadA; 1.
4CE 590 AA; 61661 MW;
 Outer membrane protein GNA992
 93.1%;
84.8%;
 92.0%;
82.3%;
 4 TLKAGDNLKIKQ-----
 Best Local Similarity 84.8
Matches 196; Conservative
 Matches 195; Conservative
 PRELIMINARY;
 Similarity
 SEQUENCE FROM N.A.
 01-0CT-2000
01-0CT-2000
01-0CT-2002
 Pfam; PFO
SEQUENCE
 9
 86
 Query Match
 Query Match
 Local
 Q9JPI3;
 GNA992.
 Q9JPI3
 RESULT
 Q9JPI3
 qq
 Op
 g
 Qγ
 g
 δy
 g
 ò
 g
 SO
 ŏ
 δλ
 q
 ŏ
 ò
```

4

```
STRAIN=528, and 1000;
 STRAIN-A22;
 145
 286
 Q9JPS8
Q9JPS8;
 GNA992
 RESULT 9
 ŏ
 В
 οy
 q
 ŏ
 q
 ŏ
 g
 92 WNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 284
 91
225 WNIKGVKPGTTASDNVDEVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK
 145 EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADKF 201
 4 TLKAGDNLKIKQ-----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL
 -----RAASVKDVLNAG
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Calecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Moxon D.W., Jeffiles A.C., Saunders N.J., Granoff D.M., Venter C., "Identification of Vaccine Candidates Against Serogroup B
 39;
 Score 936.5; DB 2; Length 594;
Pred. No. 7.7e-47;
0; Mismatches 3; Indels 39
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 PFam; PF03895; Yada, 1.
SEOUENCE 594 Aa; 62114 MW; 1E2A63A78F53D256 CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Outer membrane protein GNA992.
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
 54 NFAKETAGTNGDTTVHLNGIGSTLTD--------
 594 AA
 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
 ¥
 PRT;
 MEDLINE=20175756; PubMed=10710308;
 ó
 EMBL; AF226379; AAF42528.1; -.
InterPro; IPR005594; YadA.
 92.0%;
82.3%;
 Matches 195; Conservative
 PRELIMINARY;
 PRELIMINARY;
 Neisseria meningitidis.
 Neisseria meningitidis.
 Best Local Similarity
 SEQUENCE FROM N.A.
 [1]
SEQUENCE FROM N.A.
 NCBI_TaxID=487;
 NCBI_TaxID=487;
 STRAIN-NGE31;
 285
 Query Match
 GNA992.
 <u>09</u>лРНО;
09ЛРНО;
 Q9JPS2;
 GNA992.
 RESULT 7
 RESULT 8
 09JPS2
 09ЛРН0
 g
 ò
 ŏ
 g
 ŏ
 g
 οχ
 g
 ò
 셤
```

```
94 IKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL 53
 54 NFAKETAGTNGDTTVHLNGIGSTLTD------RAASVKDVLNAGWN 93
 STRAIN-RALLS;

MEDLINE-20175756; Pubbed=10710308;

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,

A Ganedutic M., Jenning G.T., Baldi L., Bartolini E., Capecohi B.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,

A Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,

Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,

Moxon E.R., Grandi G., Rappuoli R.,

"Identification of Vaccine Candidates Against Serogroup B

Meningococcus by Whole-Genome Sequencing.";

Science 287:1816-1820(2000)

R EMBL; AF226361; AAF42513.1; -

Interpor: IPR03895; YadA.;

R Pfam; PF03895; YadA.;
 MEDLINE-20175756; Pubbled=10710308;
A PIZZA M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B.,
Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B.,
A Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S.,
A Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P.,
Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H.,
A Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C.,
A Moxon E.R., Grandi G., Rappuoli R.;
Meningococcus by Whole-Genome Sequencing.";
Clence 287:1816-1820(2000)
REMBL; AF22656; AAF42509:1;
REMBL; AF22650; AAF42509:1;
REMBL; AF26505; AAF44509:1;
REMBL; AF26505; AAF44509:1;
REMBL; AF26505; AAF4509:1;
REMBL; AF26505; AAF4509:1;
REMBL; AF26505; AAF44509:1;
REMBL; AF26505; AAF4450505; AAF44509; AAF4509; AAF44509; AAF4450
 Gaps
 36;
 Length 595;
 Score 929.5; DB 2; Length 599; Pred. No. 2e-46;
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
 Indels
 62120 MW; 8212C96380142BFC CRC64;
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
 DB 2;
 91.5%; Score 931.5; DB 2
81.0%; Pred. No. 1.5e-46;
 4; Mismatches
 Outer membrane protein GNA992
 91.3%;
80.1%;
 InterPro; IPR005594; YadA.
 Query Match 91.5
Best Local Similarity 81.0
Matches 192; Conservative
 PRELIMINARY;
 4 TLKAGDNLKIKO-
 Pfam; PF03895; Yada; ernurnce 595 AA;
 SEQUENCE FROM N.A.
 Query Match
Best Local Similarity
 NCBI_TaxID=487;
```

ě

```
292 EKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQKGQADKF 348
 01-OCT-2000 (TrEMBLrel. 15, Created)
 STRAIN=NG6/88;
MEDLINE=20175756; PubMed=10710308;
 EMBL; AF226377; AAF42526.1; -.
InterPro; IPR005594; YadA.
 Outer membrane protein GNA992
 NhhA outer membrane protein.
 Neisseria meningitidis.
Bacteria; Proteobacteria;
 Matches 193; Conservative
 Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 PRELIMINARY;
 PRELIMINARY;
 Pfam; PF03895; YadA;
 Similarity
 SEQUENCE FROM N.A.
 F 201
 F 274
 01-OCT-2000
01-OCT-2002
 88
 201
 274
 SEQUENCE
 Query Match
 Best Local
 Q93QY5
Q93QY5;
 Q9JPS4
Q9JPS4;
 GNA992.
 RESULT 12
 RESULT 11
 0930Y5
 O9JPS4
 g
 d
 ŏ
 đ
 ò.
 g
 ò
 q
 q
 AC DT DT DT OC OC OC OC
 ò
 ò
 ä,
 3;
 200
 AGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT 140
 345
 WNIKGVK------NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKTSVIK 144
 49
 83
 53
 -----RAASVKDVLNAG 91
 EKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGOTGQADKF 201
 ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 -----RAASVKDVLN
 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSDTKGL
 43; Gaps
 39; Gaps
 pizza M., Scriato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galectti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nutl S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Moxon E.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.W., Grani G., Rappuoli R.; "Identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
 Length 600;
 Neisseria meningitidis.
Barteria, Proteobacteria, Betaproteobacteria, Neisseriales,
Neisseriaceae, Neisseria.
NCBI_TaxID=487,
 Indels
 Indels
 62762 MW; 36256963E0598CD1 CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TEMBLrel. 22, Last annotation update)
0uter membrane protein GNA992.
 3;
 DB 2;
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD------
 Score 928.5; DB 2
Pred. No. 2.3e-46;
1; Mismatches 4
 54 NFAKETAGTNGDTTVHLNGIGSTLTD------
 600 AA
 Mismatches
 PRT;
 STRAIN-E26;
MEDLINE-20175756; PubMed-10710308;
.;
 EMBL; AF226371; AAF42520.1; -. InterPro; IPR005594; YadA.
 Best Local Similarity 81.4%;
Matches 193; Conservative
 91.28;
193; Conservative
 4 TLKAGDNLKIKQ----
 PRELIMINARY;
 Embu,
InterPro; IPRUJJ,
Pfam; PF03895; YadA; 1
 SEQUENCE FROM N.A.
 F 201
 F 346
 90
 141
 346
 172
 145
 8
 Query Match
 09JPS6
Matches
 RESULT 10
 O9JPS(
 g
 셤
 q
 g
 à
 qq
 ò
 ò
 g
 õ
 δ
 ò
 δ
 g
 δ
```

```
LNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT 140
 213
 141 SVIKEKBGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 200
 273
 49
 93
 87
 4 TLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 114 SVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK
 ---RAASVKDV
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Knapp B., Blair E., Mason T., Tettelin H., Hoxon D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., "Identification of Vaccine Candidates Against Serogroup B
 43;
 90.9%; Score 925.5; DB 2; Length 526;
80.1%; Pred. No. 2.9e-46;
ive 1; Mismatches 4; Indels 43
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 Betaproteobacteria; Neisseriales;
 526 AA; 54732 MW; F543C4234AFB07CA CRC64;
(TrEMBLrel. 15, Last sequence update) (TrEMBLrel. 22, Last annotation update)
 01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD----
 Meningococcus by Whole-Genome Sequencing."; Science 287:1816-1820(2000).
```

us-09-771-382-39.rspt

222

```
138
 198
 283 KTSVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 342
 106 TLKAGDNLKIKONTNKNTNENTNDSSFTYSLKKDLTDLTSVETEKLSFGANGNKVNITSD 165
 ----FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT 47
 DVLNAGWNIKGVK------NVDFVRTYDTVEFLSADTKTTVNVESKDNGKKTEVKIGA
 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA
 4 TLKAGDNLKIKQ-------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNITSD
 Peak I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer
membrane protein of Nelsseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF226638; AR4686869.1;
InterProj IPR005594; YadA.
 50 TKGLNFAKETAGTNGDTTVHLNGIGSTLTD-----------RAASVKDV
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartollni E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Granoff D.M., Venter C., Identification of Vaccine Candidates Against Serogroup B. Meningococcus by Whole-Genome Sequencing.";
 43; Gaps
 Length 599;
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
00ter membrane protein GNA992 (NhhA outer membrane protein).
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 Indels
 62844 MW; BBA16EBF53C1970C CRC64;
 90.9%; Score 925.5; DB 2;
80.1%; Pred. No. 3.4e-46;
ive 1; Mismatches 4;
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD-----
 599 AA
 PRT;
 STRAIN-NGH38;
MEDLINE=20175756; Pubmed=10710308;
 Science 287:1816-1820(2000).
 Query Match 90.9 Best Local Similarity 80.1 Matches 193; Conservative
 Neisseriaceae; Neisseria.
 PRELIMINARY;
 2 ANTLKAGDNLKIKQ-
 PF03895; Yada; 1
NCE 599 AA; 62
 SEQUENCE FROM N.A.
 SEQUENCE FROM N.A.
 DKF 345
 DKF 201
 NCBI_TaxID=487;
 GNA992 OR NHHA.
 STRAIN-H38;
 199
 98
 139
 SEQUENCE
 09JPR8;
 RESULT 14
 O9JPR8
 g
 qq
 ò
 g
 ò
 a
 ŏ
 ò
 Db
 δ
 δý
 g
 ä;
 3
 138
 KTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQA 198
 47
 Pear I.R., Srikhanta Y., Dieckelman M., Moxon R., Jennings M.P.;
"Identification and characterization of a gene encoding a novel outer membrane protein of Neisseria meningitidis.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AF157603; AAK68864.1; -..
InterPro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
Pfam; PF03895; YadA; 1.
 DVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTVNVESKDNGKKTEVKIGA
 2 ANTLKAGDNLKIKQ------FTYSLKKDLTDLTSVGTEKLSFSANGNKVNIT
 48 SDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD---------RAASVK
 Gaps
 Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galecti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S., Ratti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Broeker M., Hundt E., Rampp B., Blair E., Mason T., Tettelin H., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., Mason T., Tettelin H., Maningococus by Whole-Genome Sequencing.";
 43;
 43;
 Score 925.5; DB 2; Length 598;
Pred. No. 3.4e-46;
1; Mismatches 5; Indels 43
 90.9%; Score 925.5; DB 2; Length 598; 79.8%; Pred. No. 3.4e-46; ive 1; Mismatches 5; Indels 43
 Neisseria meningitidis.
Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
 62687 MW; 18CEFFE6410A15DF CRC64;
 62763 MW; 63A6A3BD7F0F2EE3 CRC64;
 01-0CT-2000 (TrEMBLrel. 15, Created)
01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-0CT-2002 (TrEMBLrel. 22, Last annotation update)
 PRT;
 STRAIN=2996;
MEDLINE=20175756; PubMed=10710308;
 EMBL; AF226359; AAF42508.1; -.
InterPro; IPR005594; YadA.
 Outer membrane protein GNA992.
 90.98;
79.88;
 Neisseriaceae; Neisseria.
 Matches 194; Conservative
 Best Local Similarity 79.8
Matches 194; Conservative
 PRELIMINARY;
 PF03895; YadA;
NCE 598 AA; (
 Best Local Similarity
 SEQUENCE FROM N.A.
 DKF 345
 DKF 201
 NCBI_TaxID=487;
 STRAIN=BZ10;
[1]
SEQUENCE
 163
 98
 223
 139
 SEQUENCE
 Query Match
 Query Match
 Q9JPTO;
 GNA992.
 Q9JPT0
 RESULT 13
 09JPT0
ò
 d
 ŏ
 g
 ò
 g
 ö
 셤
 ò
 셤
```

3;

```
2.
 ñ
 LNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKIGAKT 140
 141 SVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 200
 286 SVIKEKDGKLVTGKGKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTGQADK 345
 84 VKDVLNAGWNIKGVK-----NVDFVRTYDTVEFLSADTKTTTVNVESKDNGKKTEVKI 136
 GAKTSVIKEKDGKLVTGKDKGENGSSTDEGEGLVTAKEVIDAVNKAGWRMKTTTANGQTG 196
 114 GAKTSVIKEKDGKLVTGKGKOGENGSSTDEGEGLVTAKEVIDAVNKAGWRWKTTTANGQTG 273
 4 TLKAGDNLKIKQ-------FTYSLKKDLTDLTSVGTEKLSFSANGNKVN 45
 46 ITSDTKGLNFAKETAGTNGDTTVHLNGIGSTLTD--------RAAS 83
 47; Gaps
 Pizza M., Scarlato V., Masignani V., Giuliani M.M., Arico' B., Comanducci M., Jennings G.T., Baldi L., Bartolini E., Capecchi B., Galeotti C.L., Luzzi E., Manetti R., Marchetti E., Mora M., Nuti S. Batti G., Santini L., Savino S., Scarselli M., Storni E., Zuo P., Hood D.W., Jeffries A.C., Saunders N.J., Granoff D.M., Venter C., Moxon E.R., Grandi G., Rappuoli R., identification of Vaccine Candidates Against Serogroup B Meningococcus by Whole-Genome Sequencing.";
 DB 2; Length 530;
 Bacteria; Proteobacteria; Betaproteobacteria; Neisseriales;
Neisseriaceae; Neisseria.
NCBI_TaxID=487;
 4; Indels
 EMBL; AF226380; AAF42529.1; -.
Interpro; IPR005594; YadA.
Pfam; PF03895; YadA; 1.
SEQUENCE 530 AA; 55190 WW; IF836CA57598515B CRC64;
 01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
01-OCT membrane protein GNA992.
 90.7%; Score 923.5; DB 2
78.8%; Pred. No. 3.9e-46;
iive 1; Mismatches 4
 530 AA
 Search completed: October 6, 2003, 09:30:55 Job time: 15.7627 secs
 PRT;
 MEDLINE-20175756; PubMed-10710308;
 Matches 193; Conservative
 PRELIMINARY;
 Neisseria meningitidis.
 Query Match
Best Local Similarity
 ||||||
QADKF 278
 QADKF 201
 SEQUENCE FROM N.A.
 346 F 346
 201 F 201
 STRAIN-NGF26
 137
 197
 Q9JPS1
 RESULT 15
Q9JPS1
 g
 δ
 q
 g
 à
 g
 g
 δ
 ò
 á
 ŏ
 g
 q
 ò
```

S PAGE BLANK (USPTO)

THIS PAGE BLANK (USPTO)